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The Dietitian and the Present Food Shortage[1]

FRANKLIN C. BING
Director, American Institute of Baking, Chicago

THROUGHOUT the world there is a food shortage. Until the next harvest, and possibly for a much longer period, all of us have been asked by the President to share our meals with hungry people in less fortunate countries. This assignment is not an easy one, for we as a nation have had no real experience with restricted diets such as the people in other countries have had. All our educational efforts hitherto have been in the opposite direction, for we have been thinking in terms of optimal nutrition and of dietary improvement through selection of foods which have been available in abundance.

The dietary allowances which we have set as a goal in practical nutrition never have been accused of being scanty. These allowances, as Colonel D. B. Dill ruefully observed, represent values which millions of people in many parts of the world might dream about but have no possible chance to obtain, for themselves or for their children. Until the recent work of Ancel Keys at the University of Minnesota, little investigation had been made in this country of the problems of caloric undernutrition. Indeed, there is but one other comprehensive American study of the effects of long continued restricted diet on human subjects, that of F. G. Benedict and his collaborators in Massachusetts, which was made during World War I.

A CHALLENGE TO THE DIETITIAN

The present food situation offers a challenge to the dietitian. We are asked to use less foods and, although the cut in usage is really not severe, the task of making it may require just as much effort as would a more stringent rationing. The problem is to devise and put into practice methods of conserving foods, of avoiding waste, of using obtainable foods and, while trying to maintain the highest possible nutritive value of the diet, have as our main objective the using of less food. Considerable ingenuity is required because some persons are in a less favored position than are others to change meal habits so as to eat less of those foods which are most needed for relief purposes. Workingmen and school children, for example, who carry lunches are apt to find it difficult to substitute other foods for bread in sandwiches. However, from the experiences of people during the war, we know that our national dietary can be curtailed much more than it will need to be in the present emergency, for a period of several months, with some discomfort but with no serious detriment to health. Who better than the dietitian is qualified to deal with the problem of showing our people how to use available foods wisely?

WHEAT FOR RELIEF FEEDING

While all foods are in short supply, the demand for relief purposes falls largely on wheat, for bread is the basis of any practical relief feeding program. If a hungry man can be given good bread, it only requires some vegetables and a little milk to have an emergency diet of fair nutritive value.

What has happened to our abundant supply of wheat? In the United States, in 1945, the wheat crop for the second straight year broke all existing records when over a billion bushels were harvested. But the utilization also was tremendous and the supply of wheat rapidly dwindled away. Considerable quantities were used for non-food purposes, such as for the production of alcohol which was needed to make synthetic rubber.

When data on the supply of wheat became available early in January, 1946, it was apparent that the United States was not going to be able to send its full quota of wheat for relief purposes, unless conservation measures were instituted at once. Reports of wheat crop conditions in other countries showed that nowhere could we expect any assistance. The problem was squarely before our own government officials for solution.

FLOUR OF 80 PER CENT EXTRACTION

The first step taken by the government was an order requiring the longer extraction of flour, in the form of a directive to the milling industry which is known as War Food Order 144. The chief feature of this order of the Department of Agriculture's

[1] Received for publication April 22, 1946.

War Food Administration is the obligation placed upon the milling industry to obtain at least 80 lb. of flour from each 100 lb. of wheat which is milled. Conventional milling procedures yield about 72 lb. of flour from each 100 lb. of wheat, so the order requiring a longer extraction, it was calculated, would save about 10 per cent of the wheat required to produce flour for domestic consumption. This saving theoretically would amount to 25 million bushels of wheat by the first of July, 1946.

The long extraction flour posed a number of technical problems to both miller and baker. In their solution the experiences of the British with long extraction flour proved helpful. The steel rolls and the bolting cloths of the mills were adjusted, methods of treating the wheat and flour were modified, and in a very short time the emergency flour was being produced. Commercial bakers experimented with the flour and learned how to handle it in the bakery.

As a result, few consumers can detect any marked changes in the appearance of bread and other bakery products. The flavor of the baked products, in the opinion of many persons, has been improved. The bread has an attractive, darker crust color, and has good toasting qualities. Some baking failures are bound to occur with long extraction flour, because of the greater variability of the flour and its inferior baking quality, but on the whole the performance has been beyond the original expectations of technologists in this field.

Long extraction flour contains portions of the bran and wheat germ, both of which contain substances which have a deleterious effect on the baking quality of the flour. Proteolytic enzymes, for example, are present and cause a weakening of the gluten during mixing and fermentation of the dough, and thereby tend to introduce difficulties in the handling of the dough in the bakery. At first it was thought that long extraction flour would have characteristics which were intermediate between those of whole wheat and those of patent flour, but it has been found that the emergency flour has properties of its own. Further, flour from hard winter wheat has different properties in the bakeshop from flour that has been milled from hard spring wheat. These technologic problems, as has been stated, were studied in the laboratories of the American Institute of Baking and in other laboratories, and bakers have been supplied with information which has been helpful in their production operations.

Some of the details of the handling characteristics of bread dough made with long extraction flour may be of interest. A striking property of 80 per cent extraction flour which has been noted in all mechanically equipped bakeries is the markedly shorter time required for mixing the ingredients to form the dough. If mixed for a time interval which would be considered normal for ordinary white flour, the dough made with longer extraction flour would be slack and sticky. In one shop, where for experimental purposes no changes were made in mixing procedure, 4 men spent 3 hours cleaning out pieces of dough which stuck to the cups of the overhead proofer. Improperly mixed doughs make poor quality loaves. Changes in fermentation and adjustments of dough formulas were also required to produce acceptable bread. Some of the problems concerned with cake production, in which flour from soft winter wheat is used, still remain to be solved.

COMPOSITION OF LONG EXTRACTION FLOUR

The composition of wheat varies considerably, depending on whether it is hard or soft wheat, spring wheat or winter wheat. It varies also with variety of wheat, locality where grown, crop year and other factors. The average values of analyses of samples of the new 80 per cent extraction flour, as obtained in the laboratories of the American Institute of Baking, are shown in Table 1. For comparison there are also shown data obtained from various sources of the composition of ordinary white flour, whole wheat and enriched flour.

TABLE 1

Average composition of wheat flour

FLOUR	MOISTURE	ASH	PROTEIN	FAT	FIBER	THIAMIN	RIBOFLAVIN	NIACIN	IRON
	%	%	%	%	%	*mg./lb.*	*mg./lb.*	*mg./lb.*	*mg./lb.*
White flour	11.9	0.46	11.2	1.0	0.2	0.35	0.15	3.5	3.2
Hard wheat flour—80% extraction	12.4	0.62	11.8	1.2	0.5	1.12	0.45	9.3	7.5
Whole wheat flour	11.3	1.8	13.3	2.2	1.9	2.25	0.60	26	17.5
Enriched flour minimum standards	—	—	—	—	—	2.0	1.2	16	13

These figures show clearly that flour of 80 per cent extraction has a somewhat higher protein content, is richer in thiamin, riboflavin and niacin, and contains more fiber, fat, iron and other mineral elements, than ordinary white flour. This means simply that the long extraction flour contains more of the branny coats and the germ of the wheat. However, it is evident from the data that the amounts of iron, thiamin, riboflavin and niacin are still far short of

the average values for whole wheat flour, or the minimum required amounts of these nutrients in enriched flour. Bread made from long extraction flour would be nutritionally inferior to enriched bread. The milling industry accordingly decided to continue the enrichment of family flour and the baking industry asked the War Food Administration to consider as "white bread" all ordinary bread and rolls made from the 80 per cent extraction flour, even though the bread from a legal interpretation of requirements might not be considered as "white bread." Thus, commercially baked bread and rolls made from the longer extraction flour are considered to come under the provisions of War Food Order 1, in effect since January, 1943, which is a government directive requiring bakers to enrich these products so that they meet established standards for the three important B-vitamins and iron.

Most bakers also are continuing to use their regular enrichment wafers in the customary quantities used previously for the enrichment of dough made with ordinary flour, because of the variability of the vitamin content of long extraction flour, as shown in Table 2. As a result, consumers will still be obtaining baked products of the same high nutritive values as they have received during the last several years.

TABLE 2

Range of values of 80 per cent extraction flour

	LOW	HIGH
	mg./lb.	*mg./lb.*
Thiamin	0.7	1.5
Riboflavin	0.18	0.50
Niacin	5.0	10.0
Iron	5.0	10.0

It is known from reports in the scientific literature that flour of 80 per cent extraction provides more pyridoxine, pantothenic acid and other substances, but the human requirements for these nutrients are not known, and hence the nutritional advantage of the higher content is not evident. Nor is the slightly higher protein content of nutritional significance except for people in countries on relief. In those countries the extraction rate is 85 or 90 per cent or higher. Some concern has been expressed over the higher content of phytin in longer extraction flour, but a review of the literature on the physiologic significance of phytin should convince anyone that fear of harm on this score is wholly unfounded. The data also show that the fiber or roughage content is not enough higher than that of ordinary flour to cause concern about its effect on digestibility or utilization of nutrients, a phenomenon investigated by Rubner with the bread made in Germany during World War I. Bread made with 80 per cent extraction flour is still low in roughage content.

It is of passing interest that 80 per cent extraction flour approximates the composition of Canada approved flour, which, according to Canadian millers, is about 78 per cent extraction.

OTHER EFFECTS OF LONG EXTRACTION FLOUR

While the order requiring the milling of wheat to 80 per cent extraction theoretically effects a saving in wheat, it also brings about a considerable reduction in by-products consisting of bran, wheat germ and the adhering endosperm of the grain. These by-products are not wasted, but are used for specialty products and for animal feeds. With War Food Order 144, which became effective March 1, 1946, each hundred-weight of wheat produced only 20 lb. of mill feed instead of the customary 28 lb. This decrease of more than one-fourth of the mill feed presented a problem to the farmer. No substitutes for feeding livestock were available so there was good reason to hold grain on the farm instead of selling it to the miller.

Other measures taken by the government to conserve wheat include restrictions on inventories of flour by both millers and bakers, and severe restrictions on the use of grain for non-food purposes, such as in the production of alcoholic beverages. The original wheat conservation order was modified to permit the production of farina. Used either alone or in combination with other foods farina is useful in the feeding of infants and invalids because of its low fiber content and other dietary properties. Later the order was amended to permit the milling of flour to 72 per cent extraction for export purposes to tropical countries. The reason for this step is eminently practical. Long extraction flour, from all available evidence, can be expected to be more susceptible to spoilage by insect infestation, especially at the higher temperatures and humidities characteristic of the tropics.

EDUCATION OF THE PUBLIC

No doubt the necessity to act quickly and the acknowledged slowness of purely educational methods was responsible for the government's decision to seek the aid of advertising and publicity experts rather than scientists and educators in asking the American public to buy less food in order to feed starving people in other countries. A Famine Emergency Committee was formed for policy and propaganda purposes and the decision was made not to ration consumers directly but to rely on the voluntary restriction of food purchases. The public was provided with figures of how many loaves of bread would be saved by 40 million families if each person ate one or two slices less of bread each day.

Consumers were admonished to eat oatmeal in place of toast, and to reach for a potato instead of an extra piece of bread. The fact appears to have been

overlooked that, while potatoes and oatmeal are excellent foods and while there is plenty of support for recommending these foods at any time and especially in the present emergency, there is no complete substitute for bread. People do not change food habits readily and people who have been conditioned to a rationing system for several years may not respond quickly to an entirely different method of distribution of foods in short supply.

INDIRECT RATIONING OF FLOUR AND BREAD

Whatever the reason it is a fact that the wheat conservation order was not effective in saving wheat. Further action was needed in order to ship more abroad, and so the decision was made to ration commercial users of flour. Late in April an order was written restricting bakers and other commercial purchasers of flour, beginning April 22 and extending to June 30, 1946, to 75 per cent of their utilization of flour in the same period in 1945. Inventories of flour were restricted still further, and farmers were offered a bonus and other incentives for all wheat sold to the government before May 25, 1946. These drastic measures certainly should permit the shipment of more wheat to other countries.

In this entire government program the baking industry has cooperated in every possible way, just as it has cooperated with government directives throughout the war. The various bakery trade associations emphasized to their members once again the practical measures which bakers could take to avoid waste in the bakery. The baking industry has redoubled its efforts to avoid waste in the production and distribution of its products. The industry has cooperated also in the government campaign to instruct consumers in methods of using bread wisely in the home.

NECESSITY FOR ACTION NOW

In the present campaign to conserve all foods, and to use available foods wisely, dietitians have a responsibility as well as an opportunity. The objectives are to avoid waste of all foods, and to save wheat products and fats especially. No one is more competent to lead the way in this national task than the dietitian and home economist. What is needed now is action—action which is based on a sound knowledge of foods and nutrition. All of us may be confident that the American public will cooperate as they have in every humanitarian project in the past, as long as the objectives and methods are simply and honestly stated. The campaign to save food must be pursued with vigor, day by day, until the threat of mass starvation is eliminated from the world.

NUTRITIONAL STATUS OF DUTCH CHILDREN

Although rations in Holland were insufficient during the entire German occupation, greater difficulties began after September 1944. From that time on babies received ¾ of a liter of milk, containing 2 per cent butterfat; their sugar rations were reduced to approximately 20 gm. a day. From September 1944, to May 1945, people still received some margarine, later on, only a small quantity of rape oil. The rations of potatoes were decreased from 1 kg. a week to almost none. Vegetables were difficult to get. There was no gas, electricity or coal for cooking. For children over 1 year of age, less than ¼ liter of skim milk daily was available. For these children, total protein declined to 10 to 15 gm. a day, the amount of fat declined from about 30 gm. in August 1944, to 2½ gm. in February 1945.

The quantity of vitamin A, especially for children over 1 year of age, was about 70 I.U. a day. The amount of vitamin B_1 was estimated at 220 mcg. daily in April, that of nicotinic acid at 4 mg. The quantity of vitamin C was also low because of the lack of potatoes, but when Brussels sprouts were available, it was proportionately higher. In Rotterdam, 300,000 I.U. of vitamin D_2 were given every 6 months to nearly all children under 4 years of age.

Although during 7 months the rations for children in Holland were extremely low (averaging 800 calories, 25 gm. of protein and 12 gm. of fat, with low vitamin values) striking deficiencies were seldom seen with the exception of vitamin A. Anemia and decalcification of the bones were prevalent. Nearly all children lost weight and were retarded in growth. Their susceptibility to infection increased.—*J. H. P. Jonxis, M.D., Children's Hospital, Rotterdam, Holland, in Nutrition Reviews, 4:97, 1946.*

Controversial Aspects: Yeast in Human Nutrition[1]

HARRY W. von LOESECKE

Production and Marketing Administration, U. S. Department of Agriculture, Washington, D. C.

YEAST as a food, particularly as a source of protein, first received serious attention during World War I when the Germans produced large quantities, mostly from wood sugar solutions, to supplement the low-protein diets of that period. From data available, the project did not seem to meet with very great success, perhaps because the amounts of yeast fed were too great to be well-tolerated. In World War II, however, the Germans again produced food yeast at an estimated rate of about 100,000 tons annually. At the Zellstoffabrick Waldof alone yeast was produced at the rate of 14 tons a day from waste liquor of a beechwood pulp plant (1).

In Great Britain, before and in the early days of World War II, some attention was given to the possibility of using dried yeast as a feed for livestock. Later when the food supply deteriorated, considerable thought was given to the use of yeast as a food, particularly to supplement the diets of certain people in Colonial possessions. Thaysen (2) and his coworkers developed a thermophilic rapidly growing strain of *Torula utilis* (*T. utilis var. thermophil*) which can be propagated in tropical countries, and a plant has been erected in Jamaica, B.W.I., to produce this yeast on a large scale (3).

It should perhaps be pointed out that the inclusion of yeast in the human dietary is based chiefly on its supplemental value, mainly for supplementing the amino acid and vitamin deficiency of cereal grains. It should not be expected to act as the sole source of protein in the dietary of either animals or humans. The data presented in this paper should therefore be interpreted with this thought in mind.

In the United States, yeast for use as a food is a relatively new idea. During World War II, large quantities of brewers' yeast were salvaged for animal and human consumption. In 1945 approximately 10,868,883 lb. brewers' yeast were dried, of which 2,509,281 lb. were debittered to be used as nutritional yeast. In addition, approximately 5,700,000 lb. of primary grown yeast were produced for nutritional purposes.

[1] Received for publication January 28, 1946.

ECONOMICS OF YEAST AS A SOURCE OF PROTEIN

Brewers' yeast is a salvaged product and cost of production probably does not exceed 7 cents per lb. Weber *et al.* (4) give drying costs of from 2 to 4 cents per lb., but this apparently applies to undebittered brewers' yeast which could not be used for food purposes. Debittered brewers' yeast sells for about 40 cents per lb. In terms of unit cost of yeast protein for human consumption, with an average protein content of 50 per cent, a value of 80 cents per lb. can be calculated. A comparison of this value with the cost of protein in other proteinaceous human foods indicates the possible significance of yeast in the economics of human nutrition (Table 1). It should be pointed out that yeast, as well as many of the other foods listed, has value as food independent of the protein content. Yeast, for example, in addition to its high protein content, is one of the richest sources of the vitamin B complex, and contains substantial quantities of essential minerals.

TABLE 1

*Approximate cost of yeast protein in comparison with other proteinaceous foods**

PRODUCT	COST PER LB.	PROTEIN CONTENT	APPROX. COST OF PROTEIN PER LB.
	¢	%	¢
Yeast, dry (5% moisture)	0.40	50.0	0.80
Soybean flour (low fat)	0.0482	40.0	0.120
Soybean flour (high fat)	0.0605	35.4	0.171
Whole milk (dry)**	0.3313	26.9	1.23
Milk solids not fat (dry)	0.1625	35.4	0.458
Cheese	0.2325	24.4	0.953
Salmon, canned	0.3125	20.8	1.50
Eggs, dried	1.13	46.5	2.43
Beef, choice	0.22	21.3	1.03
Pork, loins	0.259	16.6	2.56

* Prices will vary with time and section of the country, but those given represent prevailing prices on the same market at time of compilation and are deemed satisfactory for comparable purposes.

** Spray dried, vacuum packed.

Another way of approaching the economics of yeast as a source of protein would be to evaluate the cost on a man-hour basis. For example, what is the man-hour cost for producing yeast protein as compared with producing soybean protein? Although there are apparently no published data for such calculations, it would appear that the man-hour cost for producing yeast protein would be less than for soybean protein. In the latter case, man-hours for cultivating, fertilizing and planting, harvesting, transporting beans to mill, extracting the oil and packaging the flour are only some of the factors which would have to be considered. In the case of yeast protein, man-hours for collecting yeast slurry from breweries, drying the slurry and packaging would be the chief factors considered.

From Table 1 it will be seen that at present yeast is an expensive source of protein compared with soybean flour or milk solids.

TABLE 2

*Approximate cost of supplying the minimum daily requirements of vitamins when using brewers' dry yeast and when using synthetic vitamins**

VITAMIN	COST WHEN SUPPLIED BY:	
	Yeast	Synthetic Vitamin
	¢	¢
Thiamin	0.78	0.024
Riboflavin	4.2	0.040
Niacin	2.7	0.010

* Assuming the yeast to have the following potencies: Thiamin, 17.0 mg./100 gm.; riboflavin, 4.2 mg./100 gm.; niacin, 48.0 mg./100 gm. The yeast is assumed to cost 40¢ per lb. The following costs are assumed for synthetic vitamins: Thiamin, $72.72 per lb.; riboflavin, $90.90 per lb.; niacin, $3.18 per lb. The daily requirements are for a moderately active man on a diet supplying 3,000 calories; 1.5 mg. thiamin, 2.0 mg. riboflavin, 15 mg. niacin.

As a source of vitamins (thiamin, riboflavin or niacin) yeast would compete with the synthetic products. Table 2 shows the approximate cost of supplying the minimum daily requirements of these vitamins using yeast and the cost of these vitamins when supplied by the synthetic product. The data indicate that as a source of thiamin, riboflavin and niacin, yeast is much more expensive than the synthetic product. Thus, it would require approximately 47.6 gm. of yeast to supply the daily minimum requirements of riboflavin. However, at the same time this quantity of yeast would furnish more than the daily minimum requirement for thiamin and niacin (about 8 times the minimum daily requirement of the former and about 1.5 times the daily minimum requirement of the latter). The total cost for supplying the daily minimum requirement for thiamin, riboflavin and niacin would be about 4 cents if supplied by yeast as compared with 0.07 cent if supplied by synthetic vitamins. It is recognized that yeast contains vitamins of the B complex other than those listed above, but the function of many of these other factors in human nutrition still remains obscure.

PREPARATION OF YEAST FOR FOOD

The species of yeast used in the United States is generally some strain of *Saccharomyces cerevisiae*. This is grown either on a wort of molasses (cane or beet or a mixture of the two) or is recovered from beer. Yeast obtained by the former method is known as "primary grown." If obtained from beer, the bitter hop resins must be removed before the yeast can be used for food purposes. One method of accomplishing this is by treating the yeast with an alkali such as sodium carbonate or sodium hydroxide. The yeast, in suspension, is treated with sufficient sodium hydroxide to obtain a *p*H of 11 or 12, and at a temperature of 8.3°C. (47°F.). If sodium carbonate is used, the *p*H is generally maintained at not

TABLE 3

Composition of various species of yeast (condensed and recalculated from data of National Research Council. Report on collaborative studies on seven commercially important yeasts. Mimeo. Feb. 5, 1944)

SPECIES	MOISTURE	PROTEIN NX6.25	FAT	CRUDE FIBER	CARBOHYDRATE	ASH	THIAMIN	RIBOFLAVIN	NIACIN	PANTOTHENIC ACID	ERGOSTEROL
	%	%	%	%	%	%	*mg./100 gm.*	*mg./100 gm.*	*mg./100 gm.*	*mg./100 gm.*	*mg./100 gm.*
T. utilis	7.66	43.87	1.26	1.17	38.55	7.49	1.7	4.7	19.0	86.0	510.0
*S. cerevisiae**	4.30	39.25	1.82	2.01	42.44	10.18	17.0	8.0	25.0	112.0	500.0
S. cerevisiae	3.90	46.02	2.35	2.15	39.85	5.73	20.5	7.6	29.0	122.0	700.0
*S. cerevisiae***	4.85	51.46	1.48	2.03	32.04	8.14	17.5	4.2	48.0	86.0	340.0
*S. cerevisiae***	3.69	50.89	1.05	1.82	35.67	6.88	17.5	4.5	37.0	72.0	180.0
*S. cerevisiae***	6.46	49.06	0.43	2.55	34.66	6.84	16.0	3.6	32.0	74.0	240.0
S. cerevisiae†	5.13	48.49	1.05	2.70	35.07	7.56	3.0	7.5	38.0	13.5	810.0

* Containing 6 per cent added salt.

** Debittered brewers' yeast.

† Primary grown.

more than 10. The yeast is then centrifuged, the separated material suspended in water adjusted to *p*H 9, again centrifuged and washed with water of *p*H 7 (5). After again centrifuging the yeast, the slurry obtained is either spray-dried or drum-dried, the latter method being considered the most economical. A certain amount of the vitamin content is lost during this process.

If the yeast is enriched with vitamins, these are added to a water suspension of the washed, debittered yeast cells and the mixture allowed to stand for about 16 hr. at 8.3°C. (47°F.). Practically all the thiamin will be absorbed by the cells, but absorption of riboflavin and niacin is considerably less and of little significance. There are numerous patents covering methods for increasing the vitamin content of yeast. Burton (5) describes a commercial method in which the yeast suspension is treated with autolyzed yeast. During autolysis thiamin and other B vitamins are apparently liberated from their unphosphorylated complexes, and are then absorbed by the live yeast cells. This method would appear to be rather wasteful since the autolyzed yeast cells are discarded after use.

TABLE 4
Vitamins in Yeast [Rudolph (8)]

B_1—Thiamine, (antineuritic factor).*
B_2—Riboflavin (thermostable growth factor).**
B_3—Pigeon growth factor, thermolabile factor.
B_4—Antiparalytic factor.
B_5—Pigeon growth factor, thermostable factor.
B_6—Pellagra preventive factor for rats.
B_7—Enteric. vitamin.
B_w—Filtrate growth factor.
B_x—Anti gray hair factor.
Nicotinic acid (amid), pellagra preventive for man.†
Pantothenic acid. Chick antidermatitis factor, pellagra preventive for hens.
Hämogen. Extrinsic factor, antianemic factor.
Vitamin M. Aleukemia preventive factor, maturity factor.
Tropical anemia preventive factor.
Factor W, alcohol-ether precipitate factor, growth factor for rats.
Provitamins D_2 and D_3. Antirachitic factor (after irradiation).
Vitamin E. Tocopherol, antisterility factor.
Vitamin H. Biotin, yeast growth factor, antiseborrhea factor.
Yeast growth factor H^1, p.-Aminobenzoic acid.
Inositol, yeast growth factor, anti alopecia factor (for mice).
Cholin, growth factor for rats.
β-Carotene, provitamin A (only found in *T. rubra*).
Vitamin C, ascorbic acid, antiscorbutic factor (?).
Vitamins L_1 and L_2. Lactation factors.

* Vitamin B_1 is present in yeast almost exclusively as aneurin diphosphoric acid (cocarboxylase).

** Prosthetic group (esterified with phosphoric acid) of the yellow ferment that is also present in yeast.

† Active constituent of codehydrases which are also present in yeast.

The composition of dried yeast will vary according to species and methods of propagation (6, 7). For this reason the values given in Table 3 should not be considered as absolute.

VITAMINS OF YEAST

As has been said, yeast is one of the richest sources of the vitamin B complex. Rudolph (8) has listed and described the vitamins found in yeast and these are given in Table 4. Since the quantities of these vitamins will vary with conditions of propagation and subsequent treatment, and since the chemistry of some of them is obscure, it does not seem feasible to attempt an indication of quantitative data. It has been found, for instance, that the so-called B_w factor is in reality folic acid and biotin. Although Rudolph lists ascorbic acid as a probable constituent of yeast, qualified by an interrogation mark, there is no evidence that yeast contains this vitamin.

Although the vitamins listed in Table 4 are known to be present in yeast, unless these vitamins are available to the organism, their use in human nutrition is of no significance. In this connection, Sure and Easterling (9) in their studies on the utilization of thiamin in brewers' yeast by rats found that such utilization was from 93–100 per cent complete. No difference in the utilization of thiamin from the yeast and from crystalline thiamin was found. In a later paper Sure (10) reported that in feeding of yeasts to rats there were large fecal excretions of riboflavin. He gives two possible explanations for this. Either the yeasts contained variable constituents which may have influenced bacterial synthesis in the gut thus resulting in a greater riboflavin output, or there may have been poor absorption (50 per cent of the riboflavin in yeast being in the combined form) because of changes brought about by dehydration.

Parsons *et al.* (11) report on the utilization of thiamin in fresh yeast by human subjects. According to these investigators, very little thiamin is absorbed from those types of fresh yeast commonly promoted as sources of vitamins. Bringing fresh yeast to a boiling temperature in water to kill the cells makes the thiamin in the yeast utilizable by the body. Experiments, however, did not support these findings in all yeasts. In this same connection, Hochberg, *et al.* (12) found that only 17 per cent of the total thiamin present in 5 samples of compressed yeast examined by them was physiologically available, or 33 per cent of the claimed potency. According to these investigators, the low availability value for thiamin could not be attributed to a slower rate of absorption of the vitamin from the live yeast.

It should be pointed out that the results of Parsons *et al.* and Hochberg *et al.* are not necessarily contradictory to those of Sure since he used dry yeast

which had apparently been killed by dehydration. However, from the works of Sure and his coworkers and of Parsons *et al.* it would seem that all factors affecting the availability of vitamins in yeast are not as yet known.

It is quite likely that dehydration destroys at least part of the vitamins in yeast. Heller (13) for example, found that drying destroyed some of the vitamins. Scheunert and Schieblich (14) on the other hand reported that the vitamin B content of yeast dried at 100°C. (212°F.) was only slightly less than that of fresh yeast. Nehring and Schramm (15) were of the opinion that the vitamin B_1 and B_2 content of yeast was not essentially changed by drying. Bing and Remp (16) found that maintaining previously desiccated yeast at 105°C. (221°F.) for 2 weeks did not affect its niacin content.

YEAST PROTEIN

The nitrogen content of nutritional dry yeast is between approximately 7.0 and 9.0 per cent (bone-dry basis). All of this nitrogen is assumed to be protein-nitrogen, an assumption which is not in accordance with known facts. Yeast contains a variety of non-protein nitrogenous constituents such as purines, pyrimidines, ammonium salts, choline, glucosamine, glutathione, etc., the nitrogen content of which would be included in determinations of total nitrogen and thus calculated as protein. Of the total nitrogen in yeast, purines account for 8–13 per cent (17, 18), pyrimidine 4 per cent (17), choline .57 per cent (17), and glucosamine .5 per cent (17). To obtain the true protein content, therefore, the figures quoted in analytical data for yeast should probably be from 13 to 18 per cent lower. Dirr and Decker (19) found, for example, that the pure protein of the yeast they studied constituted 30–43 per cent of the dry substance. Von Soden and Dirr (20) concluded from their studies that only 80 per cent of the total nitrogen of yeast was actually protein nitrogen.

The biological value of yeast protein is of importance in evaluating its place in nutrition. By biological value is meant that part of absorbed nitrogen which is retained for tissue protein synthesis. Another factor in the evaluation of yeast is its coefficient of digestibility which represents that part of food nitrogen absorbed from the gastro-intestinal tract.

Thomas (21) found that yeast protein possessed only an average value for satisfying protein requirements. Völtz and Baudrexel (22), on the other hand, reported the protein of dry yeast to be 90 per cent digestible. Rubner (23) and Wintz (24) concluded that a part if not all of the protein requirements could be furnished by yeast. Funk *et al.* (25), when using a dry yeast preparation as the sole source of protein in a diet, found that the protein was poorly assimilated and had no food value. Hawk *et al.* (26) and Murlin and Mattill (27), however, who used compressed yeast, concluded that it formed a satisfactory diet for man. Pierce (28) found that yeast nitrogen, taken in amounts of 3 to 6 cakes of compressed yeast per day, was readily retained. In some instances the amount of nitrogen retained was greater than that contained in the yeast protein itself. Pierce believed this to be due to the fact that it was organized into body protein. Another explanation, and one which Pierce does not advance, is that the retained nitrogen may have been in the form of uric acid. Pierce's experimental data may give evidence of this because two of his subjects showed no marked increase in uric acid elimination during the yeast feeding periods.

Kuen and Püringer (29) found that bakers' compressed yeast, either fresh or killed by boiling, was poorly utilized by human subjects, only 52 per cent of the yeast nitrogen being available to the organism. Dry yeast was utilized to the extent of 90.4 per cent. The authors state that the more efficient utilization of dry yeast may be caused by a change of the cell membrane induced by drying. Still and Koch (30), on the other hand, in experiments using rats, found a coefficient of digestibility for dried yeast of 72 per cent, assuming that all the nitrogen was protein nitrogen. As previously pointed out, this assumption is not correct. Rat experiments by Hock (31) indicated that up to one-half of fish meal protein in the human diet could be replaced by yeast protein.

TABLE 5

Nutritive value of proteins in various foods as estimated by the nitrogen retention method [*Anson* (*35*)]

	WHOLE YEAST POWDER	MEAT	WHOLE EGG	WHOLE MILK	DE-FATTED SOY-BEAN
Protein (Nx6.25), % of total solids	49	63	50	37	54
Coefficient of digestibility, %	75	98	100	100	86
Biological value, %	74	72	94	85	77
Over-all nutritional value, %*	55	71	94	85	66

* Coefficient of digestibility x biological value.

Dirr (32) fed *Torula utilis* at the rate of 130 gm. per day to human subjects and reported that the protein was assimilated to nearly the same extent as animal protein. Nitrogen retention was, however, higher than for animal protein. Von Soden and Dirr (20) subjected several yeasts and yeast preparations to tryptic digestion and reported excellent digestibility for all yeasts investigated.

Bickel (33), using human subjects, determined the nutritional value of yeast and found that although an increase of nitrogen retention resulted, this retention did not parallel yeast intake. However, resorption of yeast nitrogen was good and retention increased.

Nitrogen retention was more pronounced in cases where yeast was added to a standard diet than in cases of varying diet. Mitchell (34), in earlier experiments using rats, found that yeast had a biological value of 85.5 per cent when fed at a 5 per cent level. Bickel's and Mitchell's works were based on nitrogen balance studies and would not seem to apply to the yeast proteins owing to nonprotein nitrogen.

TABLE 6

Approximate percentages of amino acids in the proteins of different foods [based on data of Block and Bolling (45)]

AMINO ACID	YEAST		PEANUT FLOUR		COTTONSEED MEAL		WHOLE MILK	
	16% N	14% N	16% N	10.4% N	16% N	10.9% N	16% N	15.4% N
Arginine	4.3	3.8	9.9	6.4	7.4	5.0	4.3	4.1
Histidine	2.8	2.5	2.1	1.4	2.6	1.8	2.5	2.4
Lysine*	6.0	5.3	3.0	2.0	2.7	1.8	7.5	7.2
Tyrosine	4.2	3.7	4.4	2.9	3.2	2.2	5.3	5.1
Tryptophane*	1.8	1.6	1.0	0.65	1.3	0.88	1.6	1.5
Phenylalanine*	4.1	3.6	5.4	3.5	6.8	4.6	5.7	5.5
Cystine	1.3	1.1	1.6	1.0	2.0	1.4	1.2	1.2
Methionine*	2.0	1.8	0.9	0.58	1.6	1.1	2.8	2.7
Threonine*	5.0	4.4	1.5	0.97	3.0	2.0	4.6	4.0
Leucine*	7.3	6.4	5.5	3.6	5.0	3.4		
Isoleucine*	6.0	5.3	3.4	2.2	3.4	2.3		
Valine*	5.3	4.6	4.0	2.6	3.7	2.5		
Glycine			5.6	3.6	5.6	3.8		

* Essential amino acids.

TABLE 7

Approximate percentage amino acid distribution in yeasts (from Block and Bolling (68)). (Calculated to 16% nitrogen)

	STRAIN*										
	K 105	G1 106	G3 107	B2 108	B3 109	KFY 110	AY** 111	LYE** 112	AM 113	AM2 114	Av. values
Arginine, %	5.3	5.2	4.3	3.1	4.7	4.0	4.8	3.0	3.5	4.1	4.3
Histidine, %	3.0	2.7	2.8	3.1	3.0	2.3	2.8	2.3	2.7	3.0	2.8
Lysine, %	6.7	6.8	7.6	8.1	8.1	8.0	4.9	4.0	7.6	6.9	7.5
Tyrosine, %	3.5	3.5	3.6	3.9	3.6	3.4	3.2	2.0	3.6	3.7	3.6
Tryptophane, %	1.5	1.4	1.2	1.3	1.3	1.2	1.1	0.8	1.3	1.3	1.3
Phenylalanine, %	4.6	4.4	4.0	4.1	4.2	2.9	3.0	3.9	4.5	3.9	4.1
Cystine %	0.9	1.0	1.0	0.9	0.9	1.1	1.2	0.8	0.9	1.0	1.0
Methionine, %	2.8	2.7	2.7	2.7	2.6	2.8	2.1	2.1	2.7	2.8	2.7
Threonine, %	5.3	5.2	6.0	6.0	5.3	5.1	5.1	2.0	5.6	5.7	5.5
Leucine, %	7.1	8.5	7.3	8.1	7.4	6.8	6.8	4.4	6.1	8.0	7.4
Isoleucine, %	6.0	6.0	5.5	6.2	5.6	5.8	5.5	3.9	5.8	6.2	5.9
Valine, %	4.7	4.8	4.6	5.4	5.9	5.4	5.1	4.7	4.7	4.6	5.0

* K(105). Pure debittered brewers' yeast.
G1(106). Debittered brewers' yeast regrown as primary yeast in a molasses medium.
G3(107). Same as G1 but regrown under primary conditions for three generations.
B2(108). Primary grown strain of *S. cerevisiae* brewers' type regrown for two cycles from freshly cultured seed yeast in a molasses medium.
B3(109). Third cycle growth of *S. cerevisiae* described under B2.
KFY(110). "Kitchen Food Yeast," prepared from strain B3 by partial autolysis and using about 5 per cent, NaCl.
AY(111). "Autolyzed yeast." A mixture of 90 per cent of strain G3 and 10 per cent strain K allowed to autolyze in the presence of NaCl. The finished material is composed of approximately 50 per cent yeast solubles and 50 per cent NaCl.
LYE(112). "Liquid yeast extract," prepared from strain G2 by autolysis in the presence of an organic solvent.
AM(113). Bakers' type strain of *S. cerevisiae* grown in a medium in which all nitrogen requirements were met by ammonium salts.
AM2(114). Same strain as AM but grown in a medium in which one-third of the nitrogen requirements were met from corn steep water.

** Omitted from the average.

Table 5 indicates the nutritive value of different proteins as given by Anson (35) quoting Melnick. It should be pointed out that the nutritive values have been estimated by the nitrogen retention method and this, therefore, would also include non-protein nitrogen.

Amino acids. The importance of amino acids in the diet has become of more significance in recent years because of the researches of Rose, Holt, Murlin, Block and others. If yeast is to be looked upon as a cheap protein it must be able to supply an adequate quantity of essential amino acids. In this connection, Hock and Fink (36) have indicated that yeast is not well-balanced in respect to certain amino acids and must be supplemented to prevent symptoms of deficiency diseases. In a later paper Fink (37) stated that it was necessary to add cystine and keratin to the diet to obtain the full value of yeast protein. Skinner and Muller (38) showed that yeast and other mold proteins were relatively poor in amino acids containing sulfur. This has been confirmed by recent experiments by Klose and Fevold (39) who showed that both brewers' yeast and Torula yeast were lacking in sufficient methionine to produce (in rats) growth equal to that produced by an equivalent amount of casein.

In connection with the apparent lack of sulfur amino acids in yeast, it is important to note the relationship between such amino acids and liver damage. Thus Hock and Fink (36) observed that rats fed yeast proteins showed growth disturbances and liver injuries. The addition of cystine to the yeast protein diet corrected these conditions. The importance of sulfur-containing amino acids for functioning of the liver has been given further weight by the researches of Miller and Whipple (40), Daft, *et al.* (41), du Vigneaud, *et al.* (42) and Jackson and Block (43). It is believed by some (44) that before yeast can be used as a major source of protein for any group of people, a cheap source of sulfur-containing amino acids would have to be found as a supplement.

Many of the analytical data indicating the amount of amino acids in food materials are misleading in that the basis of calculation is not given. For instance, on the basis of 16 per cent nitrogen in yeast protein it contains 1.3 per cent cystine, while on the basis of 14 per cent nitrogen in the protein (probably the true nitrogen content), the cystine content becomes 1.1 per cent. This difference is within the experimental error in determining cystine, but for the sake of uniformity and comparison, the basis for calculations should be given in reporting the amino acid content of different proteins.

Table 6 gives data for the amino acid content of whole yeast as compared with other protein materials, on the basis of 16 per cent nitrogen and on the basis of the true nitrogen content of the different protein foods. The basic data are from Block and Bolling (45). The right-hand column under each food material gives the amino acid content calculated on the basis of the true nitrogen content of the protein. The amount of amino acids in yeast will vary with the strain (Table 7). Fink and Just (46) have reported considerable variation in amino acid content of yeast samples of the same type, but grown under slightly different conditions. It will be noted that the nitrogen in yeast protein is given as 14 per cent, but as a matter of fact little basic research has been accomplished on the proteins present in yeast.

EFFECT OF YEAST INGESTION ON URIC ACID EXCRETION

Yeast, being rich in purines and nucleoproteins, would be expected to have some effect upon uric acid excretion. The question as to whether the use of yeast will result in the origin of significant quantities of uric acid and subsequent disorders believed to be due to the presence of abnormal amounts in the body, is of importance.

Wintz (24), Salomon (47), Funk, *et al.* (25), Anderson (48) and Dirr (32) found that the use of yeast in the diet increased the output of uric acid. Dirr (32) also noted increases in blood pressure and creatinine. Still and Koch (49), on the other hand, found that the addition of yeast to a low protein, low purine diet, after a low uric acid elimination had been attained caused no increase in uric acid excretion. If the yeast was added to the diet while uric acid excretion was still high, or while the subjects were on a high protein (meat) diet, an increased elimination of uric acid occurred.

Murlin and Mattill (27) observed an increase in uric acid excretion when three or more cakes of compressed yeast were consumed daily, while Smith and coworkers (50) found no significant rise in blood uric acid even when 15 cakes of compressed yeast per day were added to the dietary. Pierce (28) found that the excretion of uric acid fell or showed no change on adding compressed yeast to the diet in 7 of 16 average 6-day trials. While it was evident that the individual subjects possessed varying capacities in metabolizing nucleoproteins, Pierce believes that the results of his study indicate that up to 6 cakes of yeast daily cannot cause an increase in uric acid production sufficiently great to exert a harmful effect on the organism.

Anderson (48) using dried yeast, found that there was an increase in the uric acid content of the blood. In one case, 75 gm. of dried yeast per day increased the uric acid of the blood in 5 days from 3.0 to 5.3 mg. per 100 cc. More recent work by Cremer and Beisiegel (51) showed that the daily ingestion by human subjects of 10 gm. of Torula yeast daily for a long period had no significant effect on blood uric acid level or uric acid excretion. A daily intake of from 23 to 30 gm. produced only a very slight increase in blood uric acid. The Council on Foods of the American Medical Association does not believe

it probable that yeast in the quantities ordinarily consumed, causes an increase in production of uric acid sufficiently great to exert a harmful effect on the organism or to lead to the formation of uric acid stones (52).

AMOUNT OF YEAST TOLERATED

As previously mentioned, the feeding of yeast to the German populace during World War I was not entirely a success, probably because of the excessive amounts consumed. The published literature gives little information relative to optimum amounts tolerated. Schottelius (53) fed 30–75 gm. per day without unfavorable reactions, while McCollum (54) gave 3 gm. per day to 351 underfed women and children. In almost every case there followed an increase in weight and appetite. Ruffin and Cayer (55), in their study on the effect of vitamin supplements on normal persons, found that in some cases ingestion of yeast caused distressing gastro-intestinal symptoms. The yeast was given as tablets of dry yeast extract weighing .5 gm. each. Six tablets were given per day, or approximately 3.0 gm. of yeast. Pierce (28) found that the ingestion of from 3 to 6 yeast cakes (equivalent to from 12 to 24 gm. of dry yeast) per day had a laxative effect. It should be pointed out that Pierce used fresh yeast. Platt (56) recommends that amounts of dry yeast fed per day per person should preferably not exceed 5 to 7 gm. He states, however, that quantities up to 3 to 4 oz. a day have been consumed by human subjects without any outward effects. Researches by Völtz and Baudrexel (22), Schottelius (53), and Hawk, Smith and Holder (26), indicated that yeast in quantities up to 100 gm. produced no ill effects. However, one or two subjects ingesting this quantity of yeast suffered from diarrhea. A more recent paper by Harris (57) recommends a daily dose of (Torula) $\frac{1}{4}$ to $\frac{1}{2}$ oz. (7.1 to 14.2 gm.), though he states that from 3 to 4 oz. (85.1 to 113.4 gm.) have been eaten without harmful effects.

Heller *et al.* (58) added dried brewers' yeast to food served workers in one cafeteria at the Brooklyn Navy Yard as a method of supplementing the supply of thiamin and riboflavin. The amount of yeast added was not stated other than at "conservative levels so the taste was not detected." Sundermann (59) *et al.* carried out experiments somewhat similar to those of Heller. They added 3 oz. of yeast to each gallon of cooked food to increase the thiamin and riboflavin content. Since an average serving of such food was calculated as 8 oz., each subject therefore received about $\frac{3}{4}$ oz. (21 gm.) of yeast.

In Goldberger and Tanner's work on the use of yeast in pellagra, 1 gm. of dried yeast per kg. of body weight was used (60). Later Goldberger, Wheeler and Tanner (61) used between 15 and 30 gm. per day, while Wheeler (62) used as much as 60 gm. per day. Spies, Chinn, and McLester (63) have given as much as 1 oz. (28 gm.) of dried yeast 3 or more times per day and sometimes even 3 oz. (85 gm.) 3 times daily. No evidence of deleterious effects from over-dosage from dried yeast was reported.

YEAST EXTRACTS

(*autolyzed or hydrolyzed yeast*)

Such extracts are used as substitutes for meat extracts; unlike meat extracts, their vitamin B content is significant. The fundamental idea in the manufacture of such preparations is to obtain the contents of the yeast cells. Generally brewers' yeast is used, preferably debittered, although some authorities believe that brewers' yeast is satisfactory if merely washed and not debittered. In the majority of cases, yeast extracts are much more tasty than ordinary dried yeast.

The use of such extracts in the treatment of certain types of macrocytic anemia has been reported (64, 65). The reported results have not been uniform and although autolyzed yeast may be of value in the treatment of some types of pernicious anemia, the evidence is not sufficiently conclusive to warrant a definite statement (52).

There are three methods for preparing yeast extracts:

1. Autolysis
2. Plasmolysis
3. Hydrolysis

Autolysis. The yeast is suspended in sufficient water to prevent local overheating. In liquid yeast (containing 85 per cent water) no water addition is necessary. The material is heated at a temperature of from 60 to 110°C. (140–230°F.) for 10 min. to 3 hr. Diller (66) recommends the lower temperature and shorter time. If brewers' yeast is used it should be debittered. After autolysis, the material is cooled, centrifuged in yeast separators and the solution concentrated *in vacuo.*

Plasmolysis. The wet yeast (debittered) is mixed with from 20–25 per cent sodium chloride and then warmed. The contents of the yeast cells are thus extracted by osmosis. The material is heated to boiling and the insoluble matter removed by filtration. The extract obtained is either vacuum concentrated or boiled at atmospheric pressures until a layer of salt forms on top. This is skimmed off and the extract allowed to settle. The supernatant liquor is then vacuum concentrated.

Hydrolysis. The yeast is heated under pressure with hydrochloric acid. The material thus obtained is filtered, the residue washed with water slightly acidified with hydrochloric acid, and the filtrate and washings neutralized with sodium carbonate. The neutralized mixture is then vacuum concentrated. An alternate method is to hydrolyze the yeast with

5 per cent hydrochloric acid at 35–80°C. (95–176°F.) for 4 days. Subsequent treatment is then essentially the same as when hydrolysis is carried out under pressure. Heating under pressure is said to destroy vitamins and a great deal of spicy flavor (66).

According to Vogel (67) 1 lb. of dry yeast will yield about 1 lb. of extract; or 1 lb. of liquid yeast will yield approximately 10 oz. of extract. Block and Bolling (68) give a yield of 1 lb. of dry extract from 12 lbs. of dry yeast. In the United States, yeast extracts are sold either as a paste or in the form of a powder.

There is a paucity of published information relative to the value of these extracts in the human dietary. The extracts in general have a pleasing salty, meaty taste and when made into broths undoubtedly act not only as a secretogogue, but contribute a certain amount of protein, salts, and in some cases vitamins of the B complex.

Aside from the yeast extracts previously mentioned, another type is found on the market. One method for preparing this type is by extracting dried brewers' yeast in an aqueous medium under proper *p*H control and then clarifying and evaporating the extract *in vacuo*. The concentrate thus obtained is preserved by adding an equal volume of a mixture consisting of equal parts of glycerin and simple sirup. Such a product is proposed for prophylaxis and treatment of conditions arising from deficiency of the vitamin B complex in the diet.

SUMMARY

From the published data, there seems to be general agreement that yeast protein is readily digested and absorbed by the rat, and that it is a satisfactory protein for the dog. However, there appears to be only fragmentary, and not always consistent data, concerning the nutritive value of yeast protein for man. This situation appears to have been well-summarized by Carter and Phillips (69) who conclude "It is not possible to reach any broad conclusions as to the potential importance of yeast as a source of protein for human diets. However, the available data indicate that yeast protein is somewhat inferior to animal protein in human nutrition and that a thorough study of the effects of long-continued yeast ingestion on blood constituents is an essential prerequisite for any recommendation concerning the inclusion of large amounts of yeast in human dietaries."

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Increased Sugar Allotments

Institutional sugar allotments for serving meals and refreshments have been increased 10 per cent for the two-month period ending June 30, according to the OPA. The increase was made possible by the allocation of 1,385,000 tons of sugar for civilians during the second quarter of this year. Sugar is granted institutional users in proportion to the number of meals served during a two-month period. Separate refreshment sugar allowances are made for individual servings with beverages and for such other foods as require special amounts.

Nutritional Improvement of Cereal Flours and Cereal Grains[1]

BARNETT SURE[2]

HALF of the world's people derive more than half of their calories from the cereals, chiefly rice and wheat. Cereals are the main source of nourishment for those in the low income levels. In the present serious food shortage, the need for improving the nutritional values of cereal grains and cereal flours has become acute.

It is the purpose of this study to show the effects on growth and protein utilization of the addition of small amounts of cultured food yeast, brewers' yeast, and soybean flour, to refined wheat flour, white corn meal, and polished rice.

I. Influence on growth and protein utilization of additions of small amounts of dried brewers' yeast (strain K) and food cultured yeast (strain G) to the proteins in enriched refined wheat flour

The effects of the substitution of 1, 3, and 5 per cent dried brewers' yeast and food cultured yeast for an equivalent amount of enriched refined wheat flour have been studied on the albino rat.

For the work on the nutritional improvement of enriched refined wheat flour, three batches of enriched flour were used. The total protein content of the different lots was 10.8, 10.4, and 10.15 per cent. It should, however, be pointed out that to obtain the total protein, the factor of total nitrogen × 5.7 was used (instead of the conventional figure of 6.25), as recommended by Jones (1), this factor being based on the nitrogen content of the two principal proteins in flour, namely, gliadin and glutenin.

All the proteins in the rations in this study were furnished by the enriched wheat flour. The salt mixture was Sure's Salts No. 1, 4 per cent (2). Cod liver oil, 2 per cent, and wheat germ oil, 3 per cent supplied all the fat-soluble vitamins and cerelose (dextrose) was the source of carbohydrate. The animals received daily an abundance of the vitamin B complex. The composition of the vitamin B complex mixtures is given at the bottom of the tables.

It is evident from Table 1 that the blending of enriched wheat flour with as little as 1 or 3 per cent dried brewers' yeast or cultured food yeast, resulted in marked increases in body weight and in biological values of the proteins, expressed as gain in weight per gm. of protein intake.

The substitution of 1 per cent brewers' yeast for an equivalent amount of wheat flour produced an increase of only 3.6 per cent of protein in the ration, but resulted in 71.3 per cent increase in body weight and 35.2 per cent increase in biological value. The replacement of 3 per cent wheat flour with an equivalent amount of brewers' yeast produced an increase of 11 per cent in the proteins in the diet but resulted in 131 per cent increase in growth and 54.5 per cent increase in biological value. While 5 per cent substitution of wheat flour with 5 per cent brewers' yeast produced a further increase in body weight, there was no further noteworthy increase in efficiency of protein utilization. It would appear then that replacement of 3 per cent wheat flour with 3 per cent brewers' yeast is the most economical level for protein enrichment.

The results of additions of small amounts of cultured yeast (strain G) to enriched wheat flour for protein enrichment are even more striking. However, in making this comparison, we must take into consideration that the control animals in Group 2, which received the G cultured yeast additions gained only 38.0 gm. per rat during the 10-week experimental period, compared with 42.2 gm. gain per animal by Group 1, which received the K brewers' yeast; also, there was some difference in the composition of the vitamin B complex mixtures of the two groups of animals. However, in spite of such differences, greater gains in weight and increases in

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[2] With the technical assistance of Leslie Easterling, Joy Dowell and Mary Crudup, of the Department of Agricultural Chemistry, University of Arkansas.

TABLE 1

Influence on growth and protein utilization of additions of small amounts of brewers' yeast (K) and cultured yeast (G) to the proteins in enriched wheat flour

(average results per animal for a 10-week period)

TYPE OF RATION	FLOUR AND YEAST IN RATION	NUMBER OF ANIMALS	PROTEIN IN RATION	INCREASED PROTEIN IN RATION	GAIN IN BODY WEIGHT	INCREASE IN BODY WEIGHT	TOTAL FOOD INTAKE	TOTAL PROTEIN INTAKE	BIOLOGICAL VALUE	
									Gain in weight per gm. of protein intake	Increase
	%		%	%	*gm.*	%	*gm.*	*gm.*		%
*Group 1**										
Enriched flour	84	12	9.07	—	42.2	—	529	48.0	0.88	—
Enriched flour	83	12	9.40	3.6	72.3	71.3	648	60.9	1.19	35.2
Brewers' yeast (K)	1									
Enriched flour	81	12	10.07	11.0	97.5	131.0	710	71.0	1.36	54.5
Brewers' yeast (K)	3									
Enriched flour	79	18	10.73	18.3	105.7	150.5	719	77.2	1.37	55.7
Brewers' yeast (K)	5									
Group 2§										
Enriched flour	84	12	8.74	—	38.0	—	557	48.7	0.78	—
Enriched flour	83	12	9.04	3.4	82.7	117.6	765	69.2	1.19	52.6
Cultured yeast (G)	1									
Enriched flour	81	12	9.67	10.6	105.5	177.7	773	74.7	1.41	80.8
Cultured yeast (G)	3									
Enriched flour	79	12	10.30	17.8	118.4	211.6	785	80.9	1.46	87.0
Cultured yeast (G)	5									

* The ration of group 1 was supplemented daily with liberal amounts of the various components of the vitamin B complex as follows: 75 μg. thiamin, 50 μg. riboflavin, 50 μg. pyridoxine, 150 μg. calcium pantothenate, 9 mg. choline chloride, 3 mg. p-aminobenzoic acid, and 3 mg. inositol.

§ The ration of group 2 was supplemented daily with liberal amounts of the various components of the vitamin B complex as follows: 100 μg. thiamin, 100 μg. riboflavin, 100 μg. pyridoxine, 600 μg. calcium pantothenate, 100 μg. nicotinic acid, 12 mg. choline chloride, 12 mg. p-aminobenzoic acid, and 3 mg. inositol.

biological values indicate that strain G cultured yeast proved a better source of amino acid supplement to the proteins in enriched wheat flour than strain K debittered brewers' yeast. The substitution of 1 per cent wheat flour with an equivalent amount of strain G cultured yeast produced 117.6 per cent increase in body weight and an increase in biological value of 52.6 per cent. Replacement of 3 per cent wheat flour with 3 per cent of this yeast resulted in 177.7 per cent increased growth and 80.8 per cent increase in protein utilization.

It is hardly likely, however, that the enormous growth responses obtained when 1 to 3 per cent of either brewers' yeast K or cultured yeast G replaced equivalent amounts of enriched flour in the rations were due solely to amino acid supplementation because such small amounts of yeasts contributed very small additions of amino acids in the ration. Part of this unusual growth response may be due to the contribution of the unknown components of the vitamin B complex in these yeasts. The same is true of the great responses observed when 1 to 3 per cent cultured G yeast replaced equivalent amounts of degerminated white corn meal, the results of which are given later in this paper. What extent the unknown components of the vitamin B complex played in such growth responses, where small amounts of yeast were added, is now under investigation.

Such marked benefits from small additions of dried yeasts to wheat flour, certainly merit serious consideration of human applications.

In 1942 Schwartz and associates (3) demonstrated on a laboratory scale that a satisfactory white bread could be baked with 2.5 per cent of debittered yeast added to the flour. When an attempt was made to further increase the yeast to 5.0 and 7.5 per cent of the flour the resulting breads were failures. The breads were scored by competent baking technologists and were judged for symmetry, bloom, color and consistency of crust, volume, color of crumb, grain,

texture, aroma, flavor, and eating quality. The results of scoring were as follows: Control (no yeast added), 87.5; 2.5 per cent yeast, 86.5; 5 per cent yeast, 74.8; and 7.5 per cent yeast, 66.7. It is apparent that the bread baked with the 2.5 per cent debittered brewers' yeast scored equally as well as that baked with the white flour alone.

In addition, the investigators claim that the 2.5 per cent yeast raised the thiamin, riboflavin, and nicotinic acid content of the bread above the tentative minimum requirements set up by the Food and Drug Administration for enriched white bread (3).

The practical aspects arising in the application of these results to the problems of food preparation have been discussed in a previous paper (4).

Not only brewers' yeast but cultured food yeasts also can be used in baking quick breads, such as rolls, muffins, biscuits, and corn bread. All these breads were baked in the Home Economics Department of the University of Arkansas by a nutrition class during the summer of 1945. They were buttered while warm, were very palatable, and did not differ in appearance, color, or texture from those baked without the yeast. For every cupful of white flour, 1 tbs. of yeast replaced an equivalent amount of flour. Carr (5) of the Michigan Agricultural Experiment Station has had similar experiences with cakes and cookies as well as with rolls, muffins, and biscuits, using dried brewers' yeast.

Cultured food yeasts or brewers' yeast can be readily used to enrich meat dishes, such as hamburger, meat loaves, soups, especially thick soups, such as bean and pea, and also in gravies, ketchup, chili sauce, tomato juice, peanut butter, and chocolate and malted milk. These yeasts mix well with these foods and food products and do not alter the taste when used in small amounts. The School of Nutrition of Cornell University has experimented with brewers' yeast in such foods with great success (6). Heller, *et al.* (7) used significant amounts of brewers' yeast successfully in meat loaves, stews, cheese dishes, baked beans, and meat balls, all of which were favorably accepted in an industrial cafeteria serving 1,500 people daily. Recently, the St. Louis Dietetic Association successfully incorporated some of the cultured yeasts in this study in baked brown bread, rolled oat muffins, beef stew, spaghetti-chili sauce, and flavored clam chowder.

TABLE 2

*Influence on growth and protein utilization of additions of cultured food yeast (G) to the proteins in milled corn meal and polished rice**

(average results per animal for a 10-week period)

TYPE OF RATION	GRAIN AND YEAST IN RATION	NUMBER OF ANIMALS	PROTEIN IN RATION	INCREASED PROTEIN IN RATION	GAIN IN BODY WEIGHT	INCREASE IN BODY WEIGHT	TOTAL FOOD INTAKE	TOTAL PROTEIN INTAKE	BIOLOGICAL VALUE	
									Gain in weight per gm. of protein intake	Increase
	%		%	%	*gm.*	%	*gm.*	*gm.*		%
Corn meal	89	12	7.48	—	27.3	—	454	34.0	0.80	—
Corn meal Cultured yeast (G)	88 1	12	7.81	4.4	50.5	85.0	595	46.7	1.08	35.0
Corn meal Cultured yeast (G)	86 3	12	8.48	13.4	91.8	236.3	685	58.0	1.58	97.5
Corn meal Cultured yeast (G)	84 5	12	9.14	22.2	109.9	302.6	772	70.6	1.56	95.0
Polished rice	89	18	5.79	—	78.5	—	686	39.7	1.97	—
Polished rice Cultured yeast (G)	88 1	18	6.14	6.0	110.9	41.3	794	48.7	2.28	15.7
Polished rice Cultured yeast (G)	86 3	18	6.84	18.1	124.9	59.1	801	54.8	2.28	15.7
Polished rice Cultured yeast (G)	84 5	18	7.45	28.7	132.7	69.0	816	60.8	2.18	10.7

* The ration of this group was supplemented daily with liberal amounts of the various components of the vitamin B complex as follows: 100 μg. thiamin, 100 μg. riboflavin, 100 μg. pyridoxine, 600 μg. calcium pantothenate, 100 μg. nicotinic acid, 12 mg. choline chloride, 12 mg. p-aminobenzoic acid, and 3 mg. inositol.

Roth and Zander (8) state that 1 tbs. of brewers' yeast powder can be stirred into each of the following amounts of food substances: 2 to 3 tbs. of peanut butter, 2 cups of gravy, 8 oz. of soup, 2 oz. of ketchup or chili sauce, 4 oz. of ground meat, and 8 oz. of chocolate or malted milk.

Recently, Sunderman, *et al.* (9) introduced strain Kitchen Food yeast in large-scale cookery to the extent of 3 oz. yeast per gal. of the finished food, allowing approximately 6 gm. yeast per 8-oz. serving. The addition of the yeast did not make the finished food less palatable or less attractive in appearance. The yeast was used to enrich Creole bean soup, chop suey, veal stew, and macaroni with tomato sauce. Only thiamin and riboflavin determinations were made in the control and the yeast-enriched foods. By the addition of this small amount of cultured food yeast, the thiamin was increased nine-fold in the Creole soup, six-fold in the chop suey, twelve-fold in the veal stew and fourteen-fold in the macaroni sauce. The riboflavin was increased five-fold in the Creole soup, two-fold in the chop suey, three-fold in the veal stew, and eight-fold in the macaroni sauce.

II. Influence on growth and protein utilization of additions of small amounts of strain G cultured yeast to the proteins in milled corn meal and polished rice

The corn meal used in this investigation was purchased as white table-milled corn meal. The total protein of several batches was constant, being 8.4 per cent. The factor used for conversion of total nitrogen to protein was 6.25.

Polished rice, of the Prolific variety, was obtained from Stuttgart, Ark., mills. Several batches had a constant protein content of 6.5 per cent. The factor used for conversion of total nitrogen to protein was 5.95, since, according to Jones (1), the nitrogen content of oryzenin, 16.8 per cent, fairly represents the nitrogen in the rice proteins as a whole.

The corn meal and polished rice were fed at 89 per cent planes of intake, introducing 7.48 and 5.79 per cent proteins in the rations, respectively.

It is apparent from Table 2 that small amounts of strain G yeast improves the quality of the proteins in white degerminated corn meal, such as is used extensively in hot bread baking in the South, even to a greater extent than the proteins in enriched refined wheat flour (Table 1). This is not at all surprising, since the wheat proteins are deficient mainly in lysine and the corn proteins are deficient in both tryptophane and lysine (10). The substitution of 1 per cent of corn meal with an equivalent amount of strain G yeast increased the protein content of the ration only 4.4 per cent but was accompanied by 85 per cent increase in body weight and 35 per cent increase in biological value. The replacement of 3 per cent corn meal with 3 per cent strain G yeast increased the protein in the ration 13.4 per cent but resulted in 236.3 per cent increase in growth and 97.5 per cent greater efficiency in protein utilization. The introduction of 5 per cent of this yeast in place of an equivalent amount of corn meal produced 302.6 per cent increase in body weight with no further increase in biological values of the protein in such ration.

The substitution of 1, 3, and 5 per cent of the polished rice with equivalent amounts of strain G yeast produced 41.3, 59.1, and 69.0 per cent increases in body weights, respectively. However, the increases in biological values were relatively small. The reason this cultured food yeast has proved of less value for enrichment of the proteins in polished rice than for the proteins in either milled wheat flour or corn meal is because the rice proteins were of higher biological value than either wheat or corn.

Twenty-four animals on the ration containing 8.9 per cent protein from enriched refined wheat flour, showed during a 10-week period, an average gain in weight per animal of 40.1 gm. and the proteins had a biological value of 0.83. On the ration containing 5.79 per cent protein from wheat flour 12 animals made an average gain in weight per animal of 19.3 gm. and the biological value on this protein level was 0.72. On the other hand, 30 rats on the ration containing 5.79 per cent protein in polished rice made an average gain per animal, during the same period of experimentation, of 74 gm. and the biological value of the rice proteins was 1.86. In other words, on the same plane of protein intake, the animals on the proteins in polished rice gained almost four times as much as those on the proteins in enriched wheat flour; also, the biological value of the proteins in polished rice was 158 per cent greater than those in the proteins of the wheat flour.

After the completion of the experiments the animals were sacrificed and the chemical composition of the bodies minus the gastro-intestinal contents was determined according to technique previously described (11). No noteworthy differences were found in the moisture, fat, protein, and ash contents of the rice and wheat-fed animals. On the same protein level (5.79 per cent) and the same amount of daily food (8 gm.), during a period of 25 days, the rice-fed animals gained 17.2 gm. per animal, and the wheat-fed rats gained only 6.5 gm. per animal. Calculating the relative gains in weight per gram of protein intake, the rice-fed animals showed 166 per cent greater efficiency in protein utilization than the wheat-fed rats. In a private communication, Dr. D. B. Jones of the Food and Nutrition Division of the Department of Human Nutrition and Home Economics, Washington, D. C., stated that our results are essentially in agreement with those in progress in his laboratory.

While a review of the literature discloses that on the same protein level (5 per cent) the proteins in whole rice are superior to those in corn and oats (12), no information was found on the relative biological

TABLE 3

*Influence on growth and protein utilization of additions of small amounts of solvent-extracted soybean flour to the proteins in enriched wheat flour**

(average results per animal for a 10-week period)

TYPE OF RATION	WHEAT FLOUR AND SOY FLOUR PER CENT IN RATION	NUMBER OF ANIMALS	PROTEIN IN RATION	INCREASED PROTEIN IN RATION	GAIN IN BODY WEIGHT	INCREASE IN BODY WEIGHT	TOTAL FOOD INTAKE	TOTAL PROTEIN INTAKE	BIOLOGICAL VALUE	
									Gain in weight per gram of protein intake	Increase
	%		%	%	*gm.*	%	*gm.*	*gm.*		%
Enriched flour	84	12	9.07	—	42.2	—	529	48.0	0.88	—
Enriched flour	83	12	9.45	4.2	65.5	55.2	638	60.3	1.09	23.9
Soybean flour	1									
Enriched flour	81	12	10.21	12.5	87.9	108.3	672	68.6	1.28	45.5
Soybean flour	3									
Enriched flour	79	18	10.96	20.8	123.4	192.4	799	87.6	1.41	60.2
Soybean flour	5									

* The ration fed to the above group of animals was supplemented daily with liberal amounts of the various components of the vitamin B complex as follows: 75 μg. thiamin, 50 μg. riboflavin, 50 μg. pyridoxine, 150 μg. calcium pantothenate, 9 mg. choline chloride, 3 mg. p-aminobenzoic acid, and 3 mg. inositol.

TABLE 4

*Influence on growth and protein utilization of additions of small amounts of solvent-extracted soybean flour to the proteins in milled corn meal and polished rice**

(average results per animal for a 10-week period)

12 animals in each experiment

TYPE OF RATION	GRAIN AND SOY FLOUR PER CENT IN RATION	PROTEIN IN RATION	INCREASED PROTEIN IN RATION	GAIN IN BODY WEIGHT	INCREASE IN BODY WEIGHT	TOTAL FOOD INTAKE	TOTAL PROTEIN INTAKE	BIOLOGICAL VALUE	
								Gain in weight per gram of protein intake	Increase in biological value
	%	%	%	*gm.*	%	*gm.*	*gm.*		%
Corn meal	89	7.48	—	29.3	—	493	36.9	0.79	—
Corn meal	88	7.88	5.3	54.5	86.0	595	46.9	1.16	46.8
Soybean flour	1								
Corn meal	86	8.68	16.0	79.8	172.4	680	59.0	1.35	70.9
Soybean flour	3								
Corn meal	84	9.47	21.2	108.6	270.7	743	70.4	1.54	95.0
Soybean flour	5								
Polished rice	89	5.79	—	69.3	—	680	39.4	1.76	—
Polished rice	88	6.11	5.5	83.6	20.6	740	45.2	1.84	4.5
Soybean flour	1								
Polished rice	86	7.05	21.8	121.3	75.0	822	58.0	2.08	18.2
Soybean flour	3								
Polished rice	84	7.89	36.3	154.9	123.5	917	72.4	2.15	22.1
Soybean flour	5								

* The ration fed to the above groups of animals was supplemented daily with liberal amounts of the various components of the vitamin B complex as follows: 100 μg. thiamin, 100 μg. riboflavin, 100 μg. pyridoxine, 600 μg. calcium pantothenate, 100 μg. nicotinic acid, 12 mg. choline chloride, 12 mg. p-aminobenzoic acid, and 3 mg. inositol.

values of the proteins in polished rice and wheat flour, fed on the same protein intake. This work and that of Dr. Jones therefore, establish the superiority of the biological value of the proteins in polished rice to those in refined wheat flour.

III. Influence on growth and protein utilization of additions of small amounts of soybean flour to the proteins in enriched wheat flour, milled corn meal, and polished rice.

In 1938 Horvath (13) gave a comprehensive review of the nutritional value of soybeans in which he discussed the clinical and experimental literature and recommended the introduction of this foodstuff in the human diet. Soy flour, however, has not been favorably accepted by the American public for three reasons: (a) The processed flour was offered to the public before it was acceptable for palatability; (b) the public has not yet been educated regarding its superior nutritional merits; (c) it was recommended to be used in excessive quantities, particularly in bread baking. The latter point has been stressed in a recent article by Vail and Smull (14).

Odor, flavor, and appearance of the final product must be considered when soy flour is used in every day cookery. However, recently processed soy flours are almost entirely free from objectionable odors or flavors. According to Vail and Smull, muffins of all types, corn bread and other quick breads, with the possible exception of biscuits, carry 10 to 12 per cent of soy flour without noticeably affecting flavor. Cookies and gingerbread are two of the most satisfactory products in which to use soy flour. In cakes part of the wheat flour, fat, or eggs, may be replaced by soy flour.

One of the most widely recommended uses of soy products is as a meat extender. Meat loaf and patties of desirable texture are obtained when 20 per cent of the meat is replaced by an equal weight of soy flour, with liquid increased. In a recent book, Lager (15) has devoted over 100 pages to recipes which the dietitian will find useful for reference.

In 1921 Johns and Finks (16) found that rats fed wheat bread gained only 1.0 gm. whereas on wheat-soy bread they gained 1.5 gm. per gm. of protein intake. In 1931 Kon and Markuze (17) showed a similar improvement in the protein quality of bread by the addition of soy flour. The latter investigators introduced the soy flour as 11 to 25 per cent of the flour mix. In 1944 Jones and Divine (18) reported the results of supplementing patent flour with 5, 10, and 15 per cent of soy flour. The biological values, expressed as gains in weight per gm. of protein intake, were as follows: For the patent wheat flour, 0.75; for the 5, 10, and 15 per cent soy flour combinations with the wheat flour, they were: 1.38, 2.16, and 2.27, respectively. Swanson (19) found when soy flour is used in bread, that if the percentage of soy flour did not exceed 5 per cent of the total, the volume, texture, and grain scores were equal to that of straight wheat bread.

Our findings that small additions of a brewers' yeast or cultured food yeast proved such a remarkable supplement to the proteins in milled cereal grains stimulated a similar study with soybean flour. These experiments were planned particularly with the objective of determining what effect soy flour would have in improving the proteins of enriched patent wheat flour, in the presence and absence of dried skim milk in proportions which could be used in baking of bread. A solvent-extracted soybean flour was used which had a protein content of 49.5 per cent and a fat content of less than 1 per cent. The composition of the rations was similar to those previously described with the exception that soybean flour was used in various proportions instead of dried yeasts. This study was carried out on albino rats. The results of this investigation are summarized in Tables 3 to 6 inclusive.

From Table 3 it is apparent that small additions of soy flour to enriched patent wheat flour improved the protein values to a remarkable degree. Substitution of 1, 3, and 5 per cent enriched flour with equivalent amounts of soy flour, while increasing the total protein in the rations 4.2, 12.5, and 20.8 per cent, resulted in increased gains in body weight of 55.2, 108.3 and 192.4 per cent; and increased biological values of 23.9, 45.5, and 60.2 per cent, respectively. To what extent the unknown components of the vitamin B complex, supplied by addition of small amounts of soybean flour, contributed to the growth accompanying such additions to enriched flour will become apparent later from work in progress.

In the construction of low cost, high protein, and high vitamin B complex diets, perhaps the best combination could be obtained by blending patent wheat flour with 5 to 10 per cent of a combination of soy flour and dried cultured food yeasts or debittered brewers' yeasts. The small amounts of the yeast would furnish an abundance of the B vitamins and essential amino acids as supplements to the proteins in wheat flour. Since soy flour is considerably cheaper than the dried food yeasts, the former would reduce the cost of enrichment and at the same time maintain the biological potency of the improved proteins of the wheat flour.

From Table 4 it is evident that small additions of soy flour improve the proteins in milled white corn meal even to a greater extent than the proteins in enriched wheat flour. Replacement of 1, 3, and 5 per cent of corn meal by the same proportions of soy flour resulted in 86.0, 172.4, and 270.7 per cent increased growth and in 46.8, 70.9, and 95.0 per cent increased protein utilization, respectively.

It is also apparent from Table 4 that soybean flour in small amounts improves the quality of the rice proteins. The substitution of 1, 3, and 5 per cent

polished rice by equivalent amounts of soy flour resulted in 20.6, 75.0 and 123.5 per cent increases in body weight. It has been pointed out that the soy flour proteins have proved more effective than strain G cultured yeast in improving the biological value of the proteins in polished rice.

Since white bread is generally baked with 5 to 6 per cent milk solids, it would be of interest to know if the proteins in soybean flour will further enrich the proteins in patent wheat flour, in the presence of such concentration of milk solids. In this connection, Harris, Clark, and Lockhart (20) reported

TABLE 5

Influence on growth and protein utilization of additions of various amounts of soybean flour, in presence of dried skimmed milk powder, to the proteins in enriched wheat flour

(average results per animal for an 8-week period)*

TYPE OF RATION	PER CENT IN RATION	PROTEIN IN RATION	INCREASED PROTEIN IN RATION	GAIN IN BODY WEIGHT	INCREASE IN BODY WEIGHT	TOTAL FOOD INTAKE	TOTAL PROTEIN INTAKE	BIOLOGICAL VALUE	
								Gain in weight per gram of protein intake	Increase
	%	%	%	*gm.*	%	*gm.*	*gm.*		%
Enriched flour	80	10.40	—	71.9	—	437	45.5	1.58	—
Dried skimmed milk	5								
Enriched flour	75	12.29	18.7	125.3	74.3	513	63.0	1.99	25.9
Dried skimmed milk	5								
Soybean flour	5								
Enriched flour	72.5	13.24	27.9	134.1	86.5	493	65.3	2.05	29.8
Dried skimmed milk	5.0								
Soybean flour	7.5								
Enriched flour	70	14.18	37.3	148.7	106.8	569	80.5	1.85	17.1
Dried skimmed milk	5								
Soybean flour	10								

* There were 1 male and 5 females in each experiment. The ration of these animals was supplemented daily with 40 μg. riboflavin during the first 5 weeks and during the last 3 weeks was supplemented daily with the various components of the vitamin B complex as follows: 20 μg. thiamin, 40 μg. riboflavin, 20 μg. pyridoxine, 100 μg. calcium pantothenate, 9 mg. choline chloride, 3 mg. p-aminobenzoic acid, and 3 mg. inositol.

TABLE 6

*Influence on reproduction and lactation of additions of various amounts of soybean flour to the proteins in enriched wheat flour, in presence of 5 per cent dried skimmed milk powder**

TYPE OF RATION	%	REPRODUCTION PERIOD	NUMBER OF LITTERS	TOTAL YOUNG BORN	YOUNG GIVEN TO REAR	YOUNG REARED	PER CENT YOUNG REARED	DURATION OF LACTATION PERIOD
		days						*days*
Enriched flour	80	160	6	51	36	36	100.0	42
Dried skimmed milk	5							
Enriched flour	75	150	6	68	36	30	83.3	23
Dried skimmed milk	5							
Soybean flour	5							
Enriched flour	70	153	8	87	48	45	93.8	21
Dried skimmed milk	5							
Soybean flour	10							

*The ration of the above groups of animals was supplemented with 40 μg. riboflavin daily during the first five weeks and during the next three weeks was supplemented as follows: 20 μg. thiamin, 40 μg. riboflavin, 20 μg. pyridoxine, 100 μg. calcium pantothenate, 9 mg. choline chloride, 3 mg. p-aminobenzoic acid, and 3 mg. inositol.

From the time of mating until the termination of the experiments the animals received the vitamin B complex as follows: 50 μg. thiamin, 50 μg. riboflavin, 50 μg. pyridoxine, 300 μg. calcium pantothenate, 9 mg. choline chloride, 6 mg. p-aminobenzoic acid, and 3 mg. inositol.

that a bread containing 2.3 per cent skim milk solids and 3 per cent soy flour was superior in nutritional value to a bread containing 6 per cent skim milk solids. Since the total protein in these breads was approximately the same, the bread containing equal quantities of soy flour and skim milk solids was superior in protein quality to that containing the same amount of protein added as skim milk solids only. Recently, Volz, *et al.* (21) demonstrated that the incorporation of 5 per cent soy flour significantly improved the protein quality of white bread which contains 3 per cent of whole milk solids.

Information is lacking regarding the contribution soybean flour could make in the baking of bread that utilized a 5 to 6 per cent concentration of milk solids. Accordingly, 5.0, 7.5, and 10.0 per cent solvent-extracted soybean flour was blended with enriched patent wheat flour, replacing equivalent amounts of the latter in the rations. Such blending was done in the presence and absence of 5 per cent dried skim milk.

Growth, reproduction and lactation were studied on albino rats. The composition of the rations and the supplementary fat-soluble vitamins were the same as previously described. The composition of the vitamin B complex mixtures is given at the bottom of Tables 5 and 6, in which the results of this investigation are summarized.

It will be noted from Table 5 that the addition of 5.0, 7.5, and 10.0 per cent soybean flour, replacing equal proportions of enriched wheat flour in the rations, even in the presence of 5 per cent skim milk powder, resulted in increased body weights of 74.3, 86.5, and 106.8 per cent, respectively. However, the greatest increase in biological value was obtained on the 7.5 per cent level of soy flour intake. From the standpoint of actual increases in body weight and efficiency of protein utilization, however, 5 per cent soy flour was the most economical level of intake.

The results on reproduction and lactation are summarized in Table 6. There were 1 male and 5 females in each experiment. Reproduction and lactation were best on the 10 per cent level of soy flour intake. However, in spite of the fact that only 83.3 per cent of the young were reared on the 5 per cent soy flour level compared with 100 per cent of the young reared on the control experiment, which contained no soy flour, lactation on the latter was a failure, while rearing of the young on the 5 per cent soy flour was quite successful.

Lactation on 80 per cent enriched wheat flour and 5 per cent dried skim milk was abnormal. The young were stunted, the nursing period was very much prolonged, lasting 42 days compared with 23 days in the group which received 5 per cent soy flour. The hair of the young in the control group which received no soy flour was rough, the nursing young were lethargic and showed characteristic symptoms of premature senility, whereas the nursing young of the group which received the 5 and 10 per cent soy flour in the wheat-milk-solids rations had sleek coats, were always active, and had youthful and vigorous appearances of animals of their age during the nursing period. It is doubtful if the failure of one of the mothers on the 5 per cent soy flour to rear her litter was due to poor lactation. Since this litter died 24 hours following parturition, it is possible that it was a nonvigorous group of young and it succumbed because of failure to suckle. Two mothers on the 10 per cent soy flour level reared their litters in 18 days, which is rather unusual even on a diet composed of natural foods.

The results of this study indicate that great nutritional benefits may be derived from the incorporation of 5 per cent soybean flour in the baking of bread with 5 per cent milk solids included in the flour mix. The Department of Milling Industry of Kansas State College, Manhattan, Kan., has now perfected the technological procedures for the baking of a soy bread, containing 5 to 6 per cent soy flour.

SUMMARY

When as little as 1 and 3 per cent of a cultured food yeast (strain G) replaced equivalent amounts of enriched refined wheat flour or table-milled white corn meal, when the latter served as the only sources of protein in a ration, there resulted 70 to 300 per cent increases in growth and 35 to 97 per cent increases in protein utilization, as manifested by increases in weight per gm. of protein intake. There was a lesser improvement in the proteins of polished rice by replacement of such rice by 1, 3, and 5 per cent of the G yeast.

Replacement of 1, 3, and 5 per cent enriched refined wheat flour, milled white corn meal, and polished rice by equivalent amounts of solvent-extracted soybean flour, resulted in great increases in growth and improvement in protein utilization. The introduction of as little as 5 per cent soy flour in an enriched wheat flour mix, containing 5 per cent dried skim milk, produced pronounced nutritional improvement, as evidenced by studies of growth, reproduction, and lactation.

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HOW CRITICAL IS THE FOOD SITUATION ABROAD

Roy F. Hendrickson, Deputy Director General, UNRRA, speaking at the National Garden Conference March 26–28, in Washington, said he endorsed the garden program because it will help produce as much food as possible.

Some of the increasing shortages had not been foreseen, he explained, as for example, the severe shortages in India caused by small crops and drought have only come to light in the last 6 or 7 weeks.

The principal reason for the development of shortages at the present time is that insufficient attention was paid last summer to the drought in the Mediterranean areas. This drought caused a short crop in Italy, France, Greece, and other Mediterranean areas. In Greece, the olive crop was the only normal one. Wheat was not even half a crop. Now, despite the substantial assistance which has been provided, the next 3 months will bring the worst crisis of all, and it is likely that the situation will remain critical into next year. The present situation as to stocks of grain on hand, the required monthly issue at stated daily average gm. of consumption or rationing levels now in effect, were estimated by Mr. Hendrickson for Greece, Italy, Yugoslavia, Czechoslovakia and Poland as follows:

Country	*Amount of grain on hand*	*Daily ration*	*Amount required monthly*
Greece	26,000 tons	320 gm.	62,000 tons
Italy	17,000 tons	225 gm.	252,000 tons
Yugoslavia	28,000 tons	300 gm.	56,000 tons
Czechoslovakia	133,000 tons	291 gm.	116,000 tons
Poland	163,000 tons		119,000 tons

Mr. Hendrickson explained that China had not been included in these estimates for, although their need is greater, it has not been possible to transport the needed supplies. In one province of China people have starved while in others they have had surpluses. This is due to the destruction of the Yangtze River transportation which has made it impossible to move much food into the interior. The 50 or 60 thousand tons of food a month they are taking is all they have been able to distribute. However, with the large number of tugs, barges, and landing craft which UNRRA is providing, they will shortly be in a position to take larger quantities. In addition to other demands, India and China are having to turn to wheat-producing sections of the world to help their seriously depleted rice stocks. In predicting future needs for wheat, Mr. Hendrickson pointed out that Poland, Yugoslavia, and Czechoslovakia should be assisted by this year's crop. However, the critical situation in Italy and Greece will not be eased even with a good crop because they are always normally deficit. There will be a continuing need in China, and India will not improve its food production for a long time.

For these reasons there may be another shortage in 1946–1947, and we should plan accordingly. Every contribution, whether through reduced personal consumption, use of a higher extraction rate for flour, or other means, will be helpful.

Plasma Ascorbic Acid and Hemoglobin Values[1]

THELMA J. McMILLAN and E. NEIGE TODHUNTER

Laboratory of Human Nutrition, School of Home Economics, University of Alabama

THE ascorbic acid and hemoglobin values of blood are influenced by diet, and both can be measured quickly and accurately with a minimum of inconvenience to the subject; they are therefore well-suited for use in mass nutrition studies. It has been suggested that where a limited number of measures of nutritional status can be made, hemoglobin values should have primary consideration (1). This study was undertaken to determine whether normal hemoglobin values would also be accompanied by plasma ascorbic acid levels indicative of an adequate vitamin C intake. A number of studies have been reported of either hemoglobin or ascorbic acid values of large groups of college students in various localities, and for a midwestern group (2) both ascorbic acid and hemoglobin have been reported, but the data are not presented for these two measures on the same individuals.

EXPERIMENTAL

Subjects: The subjects were 174 apparently healthy women students enrolled in the various colleges at the University of Alabama. They represented families from both rural and urban sections of Alabama and neighboring states. The majority, or 125, lived in the college dormitories and ate at the college dining hall, the remainder in sorority houses and at home. The study was carried on from November, 1944, to February, 1945.

Collection of Blood. Blood samples were obtained by fingerprick on two nonconsecutive mornings either after a breakfast without fruit or 4 to 5 hours after fruit had been eaten. Studies have shown that such values are comparable to fasting values (3). The first drop of blood was discarded and a sample then taken for hemoglobin determination. Approximately .6 ml. blood was collected in an oxalated vial and refrigerated until analyzed for ascorbic acid, which was done within the next 4 hr. (4). Comparable values for hemoglobin and ascorbic acid were obtained in analyses of both capillary and venous blood from the same individuals.

Plasma Ascorbic Acid. Plasma ascorbic acid was determined by a modification of the micromethod of Mindlin and Butler (5), omitting the use of KCN. A Coleman spectrophotometer was used; in order to obtain the necessary volume for reading, .5 ml. plasma and 1 ml. buffered dye were used. Sodium acetate buffer was used in 2.26 per cent concentration to give a *p*H of 4.1 for the dye-plasma mixture; *p*H measurements were made with a Beckman *p*H meter. Corrections were made for turbidity as described by Bessey (6). Readings were made for 2 aliquots of each plasma filtrate. Addition of ascorbic acid to plasma analyzed by this method yielded recoveries of -4 to $+10$ per cent, which compare favorably with those reported in the literature (5).

Each value reported is the average of 2 samples. Where hemolysis occurred the sample was discarded and another collected.

Hemoglobin. Hemoglobin determinations were made with the Cenco Sheard-Sanford Type C-5 photelometer according to the method of Sanford and Sheard (7). For each determination 2 aliquots of .20 ml. blood were used. The accuracy of the method was checked by comparison with results obtained by the Van Slyke method (8).

RESULTS

Plasma Ascorbic Acid. The distribution of the plasma ascorbic acid values is shown in Table 1. The mean value for the 174 students was .65±.022 mg. per 100 ml. Among the classes, the freshmen had the lowest mean value, .55±.027 mg.; the seniors the highest, .78±.054 mg. Seven graduates had a mean value of .99 mg. Individual values ranged from .11 to 1.65 mg. The distribution showed 24 per cent or 41 of the individuals with values below .40 mg.; and 31 per cent or 54 above .80 mg.

Hemoglobin. The mean hemoglobin value for the 174 students was 13.9±.067 gm. per 100 ml. blood;

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TABLE 1

Distribution of plasma ascorbic acid values of 174 college women

PLASMA ASCORBIC ACID	ALL STUDENTS		FRESHMEN		SOPHOMORES		JUNIORS		SENIORS		GRADUATES	
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
mg./100 ml.												
.00–.39	41	24	21	32	7	25	9	23	4	12	0	0
.40–.79	79	45	36	54	13	47	15	37	13	40	2	29
.80–.99	37	21	7	11	4	14	14	35	9	27	3	42
1.00 or over	17	10	2	3	4	14	2	5	7	21	2	29
Total	174	100	66	100	28	100	40	100	33	100	7	100
Mean plasma ascorbic acid	.65		.55		.62		.67		.78		.99	
Standard error*	±.022		±.027		±.054		±.060		±.054			

$$*S_{\bar{x}} = \sqrt{\frac{s_x^2}{n-1}} \Big/ \sqrt{n}$$

individual values ranged from 9.2 gm. to 15.8 gm. The distribution of values is shown in Table 2. Only 3 individuals, or 2 per cent, had hemoglobin values below 12.0 gm.; 16 individuals, or 9 per cent, had values above 14.9 gm.

Individual variation in plasma ascorbic acid. Several investigators have reported that plasma ascorbic acid values show considerable variation from day to day and therefore that analysis of a single blood sample cannot be relied on as a measure of dietary adequacy. Daily variations in plasma ascorbic acid in 5 subjects on uncontrolled diets were studied for periods of 4 to 5 consecutive days. All 5 individuals had levels above .80 mg. Results, as shown in Table 3, show that the level of ascorbic acid in the blood plasma fluctuated as much as .40 mg. in 5 days, but in 50 per cent of the cases variation was less than .20 mg.

Among the 174 individuals tested on 2 nonconsecutive days, 86 per cent of the samples varied less than .30 mg. and 70 per cent less than .20 mg. These data indicate that the mean of 2 plasma samples on nonconsecutive days will indicate within approximately .20 mg. the plasma ascorbic acid value for a given individual on his customary diet.

TABLE 2

Distribution of hemoglobin values of 174 college women

HEMOGLOBIN	NUMBER OF STUDENTS	PERCENTAGE OF GROUP
gm./100 ml.		
<12.0	3	2
12–12.9	18	10
13–13.9	71	41
14–14.9	66	38
15–15.9	16	9

TABLE 3

Daily variation in individual plasma ascorbic acid values

MAXIMUM DIFFERENCE IN ASCORBIC ACID CONTENT	NUMBER OF SAMPLES	
	Samples from 2 non-consecutive days	Samples from 4 to 5 consecutive days
mg./100 ml.		
.00–.09	62	2
.10–.19	59	8
.20–.29	28	2
.30–.39	12	7
.40–.49	6	1
.50	6	0
Total	174	20

Discussion

Table 4 gives the plasma ascorbic acid values obtained in similar studies for students in 4 north-

TABLE 4

Plasma ascorbic acid levels of college women as reported in the literature

PLASMA ASCORBIC ACID	NORTHWEST STUDY ALL STUDENTS	TENNESSEE STUDY	
		Freshmen	Upper-classmen
mg./100 ml.	%	%	%
.00–.39	7.6	24.0	9.4
.40–.79	42.3	41.8	37.6
.80–.99	26.3	16.8	19.5
1.00 or more	23.8	17.3	33.6
Number students	471	196	149
Mean plasma ascorbic acid	.797	.67	.84
Standard error	±.0126	±.024	±.026

western states (9) and in Tennessee (10). Comparison of these values with those in Table 1 shows that the mean ascorbic acid level found in the present study is lower than that reported in either of the other studies. The differences in the various studies is most marked in the frequency of very low and high values. Among Alabama students 24 per cent had values below .40 mg. and 10 per cent above .99 mg., while in the northwest states the proportion was 7.6 per cent below .40 gm. and 23.8 per cent above .99 mg. The Tennessee data for upperclassmen are similar to the northwest values. The difference between the mean ascorbic acid values of .67 mg. for freshmen and .84 mg. for upperclassmen in Tennessee is similar to the class difference found in this study. On the other hand, in the northwest group the mean values were .740 mg. for freshmen and .744 mg. for juniors with the higher values of .839 mg. for sophmores and .842 mg. for seniors. The mean value for Alabama students is in agreement with that of .66 mg. for 582 students in midwestern colleges (2).

There is no generally accepted standard for the normal value for either ascorbic acid or hemoglobin. The classification of plasma ascorbic acid levels used in Tables 1 and 2 is based upon the work of Neuweiler (11), who gives .80 mg. to .99 mg. as a good normal value. This value as a normal has been challenged by many who consider either a .60 mg. or .70 mg. level acceptable. Weihl and Kruse (12) in a survey of nutritional status of a high school group accept .60 mg. as a satisfactory level. Others (13, 14) present evidence that .70 mg. is normal for the average individual. In the present study 24 per cent or 41 of the values were below .40 mg., 42 per cent or 73 below .60 mg., 55 per cent or 96 below .70 mg., and 69 per cent or 120 below .80 mg.

It is generally agreed that for all persons a level below .40 mg. represents a deficiency and that levels of .80 mg. or above indicate an adequate state of vitamin C nutrition. On this basis, 24 per cent of the individuals studied were considered to be in an unsatisfactory state of vitamin C nutrition; 31 per cent were satisfactory. Accepting the lower value of .70 mg. as normal, then 55 per cent of the individuals in this study were in an unsatisfactory state of vitamin C nutrition.

In the present study there is a difference of .23± .055 mg. ascorbic acid between the means of the freshmen and senior classes. The reason for this difference is not clear. It is possible that the low values for the freshmen reflect the pattern of former food habits and thus may indicate lower dietary intakes of vitamin C. Upperclassmen, on the other hand, have had the opportunity to benefit from the adequate diets served in dining halls and sorority houses. Also the possibility cannot be overlooked that the younger students, as represented in the freshman group, may have a greater requirement for ascorbic acid than the older students.

TABLE 5

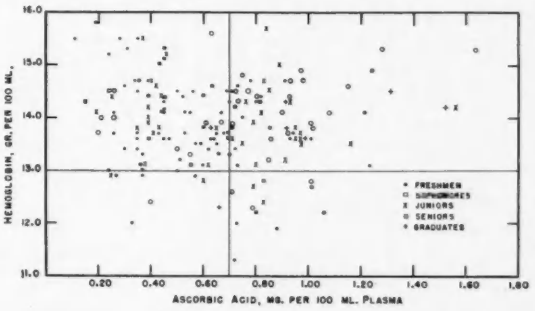
Average hemoglobin values for healthy young women as reported in the literature

INVESTIGATOR	LOCATION	HEMOGLOBIN
		gm./100 ml.
Wintrobe (15)	Baltimore	14.1
Wintrobe (16)	New Orleans	13.9
Osgood & Haskins (17)	Oregon	13.76
Everett (18)	Pennsylvania	13.16
Myers & Eddy (19)	Cleveland	13.10
Donelson et al. (2)	Midwest group	13.4
Sach, Levine & Fabian (20)	Omaha	12.96
Sheets & Barrentine (21)	Mississippi	12.4
Present Study	Alabama	13.9

Standards for hemoglobin are based upon averages for groups of apparently normal, healthy individuals studied in various localities by investigators using a number of methods. Table 5, which lists mean hemoglobin values reported in the literature for groups of similar age to the one here studied, shows a range of 12.4 to 14.1 gm. per 100 ml. blood. In the present study 2 per cent or 3 values were below 12.0 mg., 12 per cent or 21, below 13.0 gm., 53 per cent or 102 below 14.0 gm. If 13.0 gm. hemoglobin per 100 ml. blood is taken as representing a good average hemoglobin level which may be neither optimum for a given individual nor indicative of any deficiency, 21 individuals, or 12 per cent of the group fall below this standard.

FIG. 1.

Distribution of individual ascorbic acid and hemoglobin values for 174 college women. (One value of 9.2 gm. hemoglobin and 0.91 mg. ascorbic acid is omitted).



No correlation between the plasma ascorbic acid and hemoglobin levels of individuals was found. This is shown graphically in Figure 1. For some subjects high values for hemoglobin were associated with ascorbic acid levels of .40 mg. and in some cases less than .20 mg. Also, some of the lowest hemoglobin values, less than 13.0 gm. and in one case as low as 9.2 gm., were found in individuals with plasma as-

corbic acid levels of more than .80 mg. Holmes, *et al.* (22), found no correlation between the plasma ascorbic acid and hemoglobin levels of 69 children. The lower left section of Figure 1 shows the number of of individuals who failed to meet the standard for the group for both hemoglobin and ascorbic acid, and the upper right section shows those who were judged to be satisfactory in both measures. On the basis of 13.0 gm. hemoglobin and .70 mg. ascorbic acid as a standard of adequacy, the nutritional status of 8 individuals, or 5 per cent of the group, was unsatisfactory; for 65 subjects—37 per cent of the group—it was satisfactory.

SUMMARY

1. The mean plasma ascorbic acid value for 174 college students was .65 ± .022 mg. per 100 ml., with a range of .11 to 1.64 mg.

2. In 55 per cent of the students studied the plasma ascorbic acid values were below .70 mg.

3. The mean hemoglobin value was 13.9 ± .067 gm. per 100 ml., with 12 per cent of the individuals below 13.0 gm. The range of values was 9.2 gm. to 15.8 gm.

4. Of the 174 individuals studied, 5 per cent had unsatisfactory values for both ascorbic acid and hemoglobin; 37 per cent had satisfactory values for both measures of nutritional status.

5. No correlation was found between ascorbic acid and hemoglobin values of the same individuals.

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New Process for Preserving Eggs

Eggs may be stored at room temperatures for as long as six months after they have been thermostabilized, a new method developed at the University of Missouri and described in the April 15 issue of *Food Field Reporter*. The process consists of submerging a fresh egg in water of 130°F. for 15 minutes, drying it and coating the shell with oil. Temperature of the water is controlled by a special machine. Experiments were carried on for 4 years before the process finally was perfected. It is explained that the egg albumin has been stabilized, and pasteurized by the heat so that the organisms that cause deterioration are destroyed and the development of the embryo is checked. At the same time qualities of first-day freshness are retained. The process is expected to be especially valuable to egg producers far distant from markets, and those having inadequate cold storage facilities.

Vitamin Retention in Frozen Peas and Frozen Green Beans in Quantity Food Service[1]

ALICE M. BRIANT, VICTORIA E. MacKENZIE and FAITH FENTON[2]

State College of Home Economics and Agricultural Experiment Station at Cornell University, Ithaca, New York

TODAY when many workers are eating one or two meals daily in industrial cafeterias or restaurants and large groups of the armed forces are being fed in central mess halls, quantity cooking procedures should minimize, or if possible, eliminate the losses in essential nutrients. This is particularly important for vitamins which occur in present-day foods in relatively small amounts, and consequently may be low in the diet. Therefore, it seemed advisable to investigate the retention of vitamins in vegetables prepared in large-scale food service, as well as possible sources of loss.

The purpose of this study was to determine the thiamin, riboflavin, and ascorbic acid retention in frozen peas and in frozen green beans during large-scale food service. This study was an outgrowth of one begun on frozen vegetables served in a Navy mess hall (1).

In this study loose pack, frozen green peas and frozen green beans were each purchased in one lot and stored immediately in the laboratory in a cold storage room and held at approximately −10°F. (−23°C.). The studies were made about 10 months after harvest.

The peas and beans were of the 1943 pack, the peas having been packed 5 lb. to a box and the beans 4 lb. to a box. The peas were received at the laboratory in May and the beans in July, 1944.

EXPERIMENTAL PROCEDURE

Cooking Methods: Before cooking, the vegetables were partially defrosted for 3 hr. at room temperature by placing the packages in an upright position, 2 in. apart. The vegetables were cooked by 3 large-quantity methods:

Method I—The vegetables were boiled uncovered in tap water in a steam-jacketed kettle.

Method II—The vegetables were boiled uncovered in the cooking water remaining from Method I, plus tap water, in a steam-jacketed kettle.

Method III—The vegetables were steamed in an unperforated pan in a free-venting, institution type, steamer.

Each method was repeated 5 times.

In Methods I and II the vegetables were dropped into boiling water in a 25 gal. aluminum steam-jacketed kettle. The steam was fully on until the water returned to the boil after which the peas were cooked 6 min. and the beans 5 min. For holding, the vegetables, together with the cooking water were transferred to large aluminum stock-pots. These pots were then held for 30 and for 60 min. in simmering water in a *bain marie*.

In Method III the steamer was preheated, and the vegetables were cooked without added water. They were covered with a double layer of damp cheese cloth, as this treatment had been found to prevent undue discoloration. The peas were steamed to an internal temperature of 170°F., and the beans to an internal temperature of 200°F. The temperatures were obtained by threading the peas and beans on the junction of a thermocuple. Both the steamed peas and the steamed beans were held for 30 min. in the steamer at approximately 175°F.

The time required for cooking and the proportional amounts of vegetables and of cooking waters are given in Tables 1 and 2. No ingredients were added in any of the cooking methods.

Analytical procedures: Chemical methods were used for the determinations of thiamin, riboflavin, and ascorbic acid. Thiamin was determined by the thiocrome method of Hennessy and Cerecedo (2) as modified by Conner and Straub (3) and further modified by Moyer and Tressler(4). Riboflavin was determined by a modification of the method of MacKinney and Sugihara (5). The modification consisted of adjusting the *p*H of the solution to approximately 5.8 with 5 per cent sodium hydroxide

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solution before making it up to volume with the buffer. Ascorbic acid was determined by the method of Bessey and King (6) using 3 per cent metaphosphoric acid. The Waring Blendor was used to homogenize the vegetables. Preliminary studies had shown that the amount of dehydroascorbic acid was negligible as determined by the methods of Roe and Kuether (7) and of Tillmans, *et al.* (8). The percentage of moisture was determined by drying the vegetables in a vacuum oven at 70°C. for 48 hr.

RESULTS AND DISCUSSION

The thiamin, riboflavin, and ascorbic acid content of frozen peas and beans cooked by three large quantity methods, together with data on the effects of holding are given in Tables 1 and 2.

During the partial defrosting preliminary to cooking the vitamin content of neither the peas or beans changed significantly from the original values for uncooked frozen vegetables.

Method I: The peas and beans boiled in tap water showed the lowest retention of thiamin and riboflavin. The loss was found to be due to leaching rather than destruction. Holding for serving had no appreciable effect.

The uncooked frozen peas contained between .34 and .43 mg. thiamin and between .081 and .118 mg. of riboflavin per 100 gm. The uncooked frozen green

TABLE 1

*Thiamin, riboflavin, and ascorbic acid retention in commercially quick-frozen peas cooked by quantity methods**

PREPARATION OF VEGETABLES				VITAMIN CONTENT—AVERAGE, RANGE, AND PERCENTAGE RETENTION											
				Thiamin				Riboflavin				Ascorbic acid			
Method	Amount of vegetable	Amount of water	Cooking time	Uncooked frozen peas	Cooked frozen peas	Percentage retention		Uncooked frozen peas	Cooked frozen peas	Percentage Retention		Uncooked frozen peas	Cooked frozen peas	Percentage retention	
						Solid	Liquid			Solid	Liquid			Solid	Liquid
	lb.	*qt.*	*min.*	*mg./100 gm.*	*mg./100 gm.*	*%*	*%*	*mg./100 gm.*	*mg./100 gm.*	*%*	*%*	*mg./100 gm.*	*mg./100 gm.*	*%*	*%*
1. Boiled uncovered in tap water in jacketed kettle	48¼	24	10¾**	.37	.30	70	35	.10	.080	70	38	11	7.0	54	24
				.36–.39	.27–.33	66–74	34–37	.093–.11	.077–.089	67–74	36–40	5.6–16	4.0–10	45–60	22–25
Held 30 min.†					.23	63	50		.070	72	55		4.5	39	32
					.20–.25	54–75	40–59		.068–.073	64–85	45–69		1.8–7.0	33–45	28–37
Held 60 min.†					.23	62	54		.069	71	60		3.8	34	37
					.20–.25	56–72	46–62		.064–.073	65–81	53–69		1.9–6.2	29–41	31–44
2. Boiled uncovered in water from previous cooking plus tap water in steam-jacketed kettle††	48¾	24	10¾**	.37	.33	79‡	22‡	.095	.088	82‡	28‡	13	8.2	54‡	27‡
				.36–.38	.30–.36	68–86	20–25	.081–.10	.082–.098	75–94	26–30	12–15	6.4–9.6	51–57	23–30
Held 30 min.†					.28	74‡	28‡		.081	85‡	30‡		5.9	44‡	37‡
					.27–.29	68–80	23–32		.077–.084	80–95	27–34		4.5–7.4	38–52	35–40
Held 60 min.†					.27	76‡	26‡		.083	90‡	27‡		5.4	42‡	36‡
					.26–.28	74–78	23–35		.078–.086	84–98	22–34		4.2–7.4	34–55	32–41
3. Steamed in free-venting steamer	11	0	26	.39	.37	89	11	.11	.10	91	14	12	7.1	53	5
				.34–.43	.34–.40	83–94	10–13	.10–.12	.092–.12	86–98	13–16	7.5–15	3.4–11	34–69	2–7
Held 30 min.†					.37	89	9		.099	89	11		5.2	39	4
					.31–.41	83–97	8–12		.090–.11	73–100	7–15		2.7–8.6	25–54	2–6

* Each figure is the average of 5 replications.

** Four and three-quarters minutes were required for the water to return to the boil after the peas were added. They were boiled 6 min.

† For holding, Methods I and II, the cooked peas together with the cooking water were transferred to large aluminum stock pots and held in these in simmering water in a *bain marie*. In Method III, the steamed peas were held for 30 minutes in the steamer at approximately 175°F.

†† Approximately ⅔ of the cooking water was that remaining from the previous cooking; ⅓ was added tap water.

‡ Expressed as per cent of that in the raw frozen peas plus that in the cooking water at the beginning of cooking.

TABLE 2

*Thiamin, riboflavin, and ascorbic acid retention in commercially quick-frozen beans cooked by quantity methods**

PREPARATION OF VEGETABLES				VITAMIN CONTENT—AVERAGE, RANGE AND PERCENTAGE RETENTION											
				Thiamin				Riboflavin				Ascorbic acid			
Method	Amount of vegetable	Amount of water	Cooking time	Uncooked frozen beans	Cooked frozen beans	Percentage retention		Uncooked frozen beans	Cooked frozen beans	Percentage retention		Uncooked frozen beans	Cooked frozen beans	Percentage retention	
						Solid	Liquid			Solid	Liquid			Solid	Liquid
	lb.	*qt.*	*min.*	*mg./100 gm.*	*mg./100 gm.*	*%*	*%*	*mg./100 gm.*	*mg./100 gm.*	*%*	*%*	*mg./100 gm.*	*mg./100 gm.*	*%*	*%*
1. Boiled uncovered in tap water in steam-jacketed kettle	48¾	28	11**	.038 .032–.041	.027 .022–.031	58 55–61	45 39–51	.091 .079–.10	.073 .067–.085	64 56–78	44 38–49	8.2 6.7–10	5.0 4.3–6.8	49 44–55	38 34–44
Held 30 min.†					.022 .017–.027	52 44–57	52 47–55		.058 .053–.064	58 52–68	53 49–56		3.3 3.0–4.0	37 34–41	34 32–40
Held 60 min.†					.023 .019–.026	56 52–61	52 49–58		.057 .050–.062	58 50–63	56 50–61		3.2 3.0–3.7	36 33–40	32 26–36
2. Boiled uncovered in water from previous cooking plus tap water in steam-jacketed kettle††	48¾	28	11**	.037 .035–.039	.033 .030–.038	73‡ 60–85	28‡ 25–32	.090 .083–.099	.086 .077–.091	77‡ 76–79	32‡ 29–35	8.4 7.1–10	4.9 4.0–6.4	47‡ 44–50	38‡ 36–40
Held 30 min.†					.028 .024–.032	72‡ 58–82	26‡ 20–34		.071 .067–.076	74‡ 69–80	27‡ 23–32	8.2 6.5–9.4	3.9 3.4–5.0	44‡ 41–47	29‡ 24–32
Held 60 min.†					.029 .026–.032	73‡ 64–78	24‡ 20–30		.075 .070–.081	79‡ 71–85	30‡ 27–35		3.7 3.1–4.9	42‡ 37–44	27‡ 22–31
3. Steamed in free-venting steamer	11		36¼	.036 .032–.040	.035 .032–.039	84 81–95	19 17–20	.087 .078–.092	.086 .083–.089	85 78–93	21 20–24	8.2 6.5–9.4	4.2 3.1–5.0	43 37–46	11 10–13
Held 30 min.†					.033 .030–.035	79 68–91	19 16–23		.084 .080–.087	83 72–90	21 16–24		2.7 2.1–3.3	28 25–30	8 6–10

* Each figure is the average of 5 replications.

** Six minutes were required to return the water to the boil after the beans were added. They were boiled 5 min.

† For holding, Methods I and II, the cooked beans together with the cooking water were transferred to large aluminum stock pots and held in these in simmering water in a *bain marie*. In Method III, the steamed beans were held for 30 minutes in the steamer.

†† Approximately ⅔ of the cooking water was that remaining from the previous cooking; ⅓ was added tap water.

‡ Expressed as per cent of that in the raw frozen beans plus that in the cooking water at the beginning of cooking.

beans contained .032 and .041 mg. thiamin per 100 gm. and .078 and .10 mg. of riboflavin per 100 gm.

The ascorbic acid retention of boiled peas was 54 per cent and about 50 per cent for the boiled beans. The loss of ascorbic acid was due both to leaching and destruction. Further losses occurred during holding.

The ascorbic acid content of the uncooked frozen green peas was 5.6 to 16 mg. and the uncooked frozen green beans 6.5 to 10 mg. per 100 gm.

Method II: In boiling vegetables with the water from the previous cooking it was found that the thiamin and riboflavin in the vegetable plus the water totaled the values in the uncooked frozen vegetables. No change occurred during holding.

Approximately 50 per cent of the ascorbic acid was retained in the vegetables, about 32 per cent was found in the cooking water and the remainder was destroyed. A further loss occurred with holding for 30 min. Losses of vitamins may be noted in Table I.

Method III: The steamed peas and beans showed

the highest retention of thiamin and riboflavin and holding had no effect on the thiamin and riboflavin values.

On the other hand, the steamed peas showed the lowest retention of ascorbic acid, and a further loss occurred with holding.

The average and the range respectively in vitamin content of a 100-gm. portion of freshly cooked peas was: thiamin .33 (.27 to .40) mg.; riboflavin .083 (.077 to .12) mg.; and ascorbic acid 7.4 (3.4 to 10.8) mg.

The average and the range in vitamin content of a 100 gm. portion of the freshly cooked beans was respectively: thiamin .032 (.022 to .039) mg.; riboflavin .081 (.067 to .091) mg.; ascorbic acid 4.7 (3.1 to 6.8) mg.

All of the cooked and held vegetables were acceptable products, but palatability decreased with holding.

SUMMARY

Frozen peas and frozen green beans were cooked by 3 quantity methods. Some of the vegetables were held before serving. Thiamin, riboflavin, and ascorbic acid retentions were determined. The range of percentage retentions of vitamins during cooking of the peas were: thiamin from 66 to 94; riboflavin from 67 to 98; ascorbic acid from 34 to 69. The corresponding figures for the green beans were: thiamin from 55 to 95; riboflavin from 56 to 93; ascorbic acid from 37 to 55.

All of the thiamin and riboflavin lost from the vegetables was found in the cooking water. During holding after cooking, no change in the thiamin and riboflavin content of the vegetables occurred. Some of the ascorbic acid lost from the vegetables during cooking was found in the cooking water, and some was destroyed. During holding after cooking, the vegetables lost a little more of their ascorbic acid.

Although all of the vegetables were acceptable products, those boiled in tap water in the steam-jacketed kettle were scored highest and those steamed were scored lowest. The palatability of all of the vegetables decreased progressively upon holding.

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Meat Controls Will Be Continued

The removal of controls would not help the present meat situation, OPA Administrator Paul Porter told the Senate Banking and Currency Committee recently.

"The removal of controls would surely lead to distortions of distribution such as we have never seen, because it would encourage still more buyers to enter the live cattle market, and because packers who distribute their product throughout the nation would still have to outbid other buyers—with no restraints upon the bidding except what the traffic will bear," Mr. Porter declared.

Mr. Porter went on to explain that a 20 per cent increase in the nation's consumption of meat would mean an increase of about one billion dollars in the nation's food bill. He showed that because meat constitutes about 7 per cent of the average family's living costs, the expected 20 per cent increase would add $40 to the average family's grocery bill in the year ahead.

"This is, however, only the beginning," Mr. Porter continued. "The removal of price ceilings would encourage feeding cattle to heavier weights. This would drain more and more of our limited feed supply from the dairy and poultry industries and the industries making products from grain. This scramble for grain would increase the price pressures on dairy products and such grain products as bread and breakfast foods which make up another 13 per cent of the average family living costs."

Summing up the meat situation, Mr. Porter said, "The tremendous demand for meat, backed by the public's huge spending power, is the principal reason for the present meat shortage. During 1946 it is expected that 23.3 billion pounds of meat will be produced. That is 33 per cent more than was produced in 1939. Meanwhile, civilian demand for meat has increased more than 35 per cent."

Effect of Large-Scale Methods of Preparation on the Vitamin Content of Food: II. Carrots[1]

FRANK STREIGHTOFF, HAZEL E. MUNSELL, BEN-AMI BEN-DOR, MARTHA LOUISE ORR, MARY HAINES LEONARD, SARAH R. EZEKIEL AND FREDERICK G. KOCH

Nutrition Laboratory, Pentagon Post Restaurant, Washington, D. C

CARROTS are the most important source of carotene in the Army garrison ration and in the quantity consumed they are the third most important vegetable. Furthermore, the carrot is also one of the major sources of carotene in the hospital menu as well as in the patient's customary dietary intake.

At the present time data available on the vitamin retention in carrots are scant. It was the purpose of this study to determine vitamin content in carrots prepared by several large-scale methods and to record the correlation of carotene content to the depth of coloring.

REVIEW OF THE LITERATURE

Carotene. A review of the literature shows the carotene content of carrots to vary from 25.6 mg. (1) to 2.3 mg. per 100 gm. (2). A representative value of 12,000 I. U. vitamin A (7.2 mg. beta-carotene) per 100 gm. has been given for the edible portion of fresh carrots (3).

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The work described in this paper was done under a contract, recommended by the Committee on Medical Research, between the Office of Scientific Research and Development and the Pentagon Post Restaurant Council. Acknowledgment is made to Lt. Col. Harvey K. Allen and to Dr. Robert S. Harris, Consultant in Nutrition to the Secretary of War, for their interest and initiative in organizing this study and for their counsel and guidance so generously given in planning and carrying out this project. Appreciation is also expressed to members of the Working Committee, Dr. Robert S. Harris; Col. John B. Youmans and Maj. Wm. F. Ashe, Office of the Surgeon General; Col. Paul P. Logan and Jane C. Ebbs, Office of the Quartermaster General; and Dr. Paul L. Pavcek, Secretary of Food and Nutrition Board, National Research Council, for their valuable assistance in selecting the foods to be studied and the methods of preparation and of assay to be used. Grateful acknowledgment is made of the advice and suggestions of: Dr. Esther L. Batchelder; Gertrude M. Cox; Dr. Floyd S. Daft; Dr. Conrad A. Elvehjem; Dr. Faith Fenton; Commander Clive McCay; Dr. E. M. Nelson; Lura Mae Odland; Sybil L. Smith; and Dr. C. D. Tolle.

Values for carotene presented in the literature are given variously in terms of "carotene", "crude carotene", and "beta-carotene." Recent work has shown that "crude carotene" consists of several carotenoid pigments of varying biological activity. Of these carotenoid pigments, only alpha-carotene and beta-carotene are present in carrots in important quantities (4). Alpha-carotene has been reported as having half the biological potency of beta-carotene (5). Harper and Zscheile (6) reported that the carotene of a number of garden varieties of carrots contained on an average 46 per cent alpha-carotene. Kemmerer, *et al.* (4) found that the carotene of a number of samples of raw carrots contained 20 to 36 per cent alpha-carotene and boiled carrots, 23 to 41 per cent.

Harper and Zscheile (6) observed that frequently the depth of external coloring of a carrot is a rough index of the carotene concentration. In each variety of carrots studied except the *Belgium White* they found the carotene content of the phloem or bast tissue was greater than that of the xylem or woody tissue per unit length of root.

Peterson (7, 8) reported losses of carotene in the large-scale preparation of boiled carrots to be 6 to 23 per cent, buttered carrots 12 to 13 per cent, and creamed carrots 9 per cent. Oser, *et al.* (9) prepared carrots in household quantities by waterless cooking and by boiling and found carotene losses of 4 and 6 per cent respectively. Pyke, *et al.* (10) obtained data which suggested no loss of carotene when carrots were steamed.

In a study of dehydrated carrots reported by Fenton and coworkers (11) losses of carotene were as follows: 19 per cent in bringing to a boil (45 min.) and simmering 20 min.; 5 per cent in pressure steaming 15 min. and 1 per cent in boiling 25 min. There was no carotene loss in simmering for 30 min. Dehydrated carrot bricks lost 11 per cent carotene when they were brought to a boil (45 min.) and simmered 20 min.

Ascorbic Acid. The ascorbic acid content of the carrot varies markedly. Two extreme values are 31 mg. (12) and 0.8 mg. per 100 gm. (13). A representative value of 6 mg. per 100 gm. is given for the edible portion of fresh carrots (3). The ascorbic acid concentration also varies between different parts of the carrot. Rudra (12) in his work on the Indian carrot found the skin to contain 75 mg. per 100 gm. and the flesh 31 mg. per 100 gm.

Reported losses of ascorbic acid in boiling of carrots average 61 per cent (1, 7, 8, 14–19), and range from 43 per cent to 77 per cent (14), (15). Most of these data were obtained in large-scale cookery. Data reported for ascorbic acid losses after steaming of carrots by institutional methods vary from 47 to 52 per cent (10, 14, 20). Similar results were obtained by Brinkman, *et al.* (16) who cooked carrots in a pressure saucepan and in a waterless cooker and found losses of ascorbic acid of 55 and 50 per cent respectively; and by Peterson (7, 8) who reported losses of 49 and 51 per cent in the preparation of buttered and creamed carrots. On the other hand Daum *et al.* (21), found a 25 per cent loss in carrots prepared by an unspecified institutional method.

Many investigators have reported losses of ascorbic acid in cooked carrots held on a steam table for various lengths of time (10, 14, 17, 18, 20, 21). A typical example was reported by Higgins (14) who found that carrots which lost 52 per cent of their ascorbic acid during steaming, lost an additional 21 per cent when held on the steam table 1 hr. Capps and Flanagan (22) found that destruction of ascorbic acid increased as the cooking period was lengthened. Carrots boiled 15 min. lost 47 per cent ascorbic acid but those boiled 60 min. lost 60 per cent.

Niacin. The niacin content of raw carrots as reported in the literature varies from .22 mg. (23) to .71 mg. per 100 gm. (1). A representative value of .5 mg. per 100 gm. has been given (3).

Oser, *et al.* (9) prepared carrots in small quantities by a waterless method and by boiling and found losses of niacin of 1 and 29 per cent respectively. Heller, *et al.* (15) found a loss of 45 per cent in carrots boiled in large quantities. Data on niacin content of raw and cooked carrots reported by Pyke *et al.* (10) would indicate a loss of 14 per cent when calculated on the dry weight basis.

Fenton and coworkers (11) in an investigation of dehydrated carrots found niacin losses of 52 per cent in simmering 30 min.; 43 per cent in bringing to a boil (45 min.) and simmering 20 min.; 58 per cent in pressure steaming; and 42 per cent in boiling. In cooking dehydrated carrot bricks 42 per cent of the niacin was lost in bringing them to a boil (45 min.) and simmering 20 min.

As this vitamin is quite heat stable, the "lost" portion can usually be found in the cooking water; for instance, Russell, *et al.* (24) found 72 to 85 per cent of the original niacin content in the cooked carrots, and 5 to 12 per cent in the cooking water.

Thiamin. The thiamin content of raw carrots as reported in the literature varies from .025 mg. (23) to .100 mg. per 100 gm. (25). A representative value of .07 mg. per 100 gm. has been given (3).

Heller, *et al.* (15) in their study of large-scale cooking reported that 52 per cent of the thiamin was lost in boiling. Nagel and Harris (20) studied the effect of an institutional method of steaming and reported a 25 per cent loss. Fenton and coworkers (11) found thiamin losses in preparation of dehydrated carrots of 43 per cent in simmering 30 min.; 25 per cent in bringing to a boil (45 min.) and simmering 20 min.; 48 per cent in pressure steaming; and 48 per cent in boiling 25 min. In cooking dehydrated carrot bricks 43 per cent of the thiamin was lost in bringing them to a boil (45 min.) and simmering 20 min. Hinman, *et al.* (17) found an average thiamin loss of 4 per cent in family size portions of canned carrots prepared by concentrating the liquid, adding the solid portion and heating. When the same investigators boiled canned carrots by a typical Army method (18) they found that the boiled carrots contained only 64 and 68 per cent of the originial thiamin content and the boiling water 30 and 27 per cent. The actual thermal destruction of thiamin amounted to 5 and 6 per cent.

Riboflavin. The riboflavin content of raw carrots as reported in the literature varies from .040 to .10 mg. per 100 gm. (23). A representative value of .06 mg. per 100 gm. has been given (3).

Heller, *et al.* (15) in their study of large-scale cooking found a loss of 61 per cent riboflavin when carrots were boiled. Pyke *et al.* (10) found a loss of 7 per cent (calculated on the dry weight basis) in carrots boiled in an Army Student Training Program mess. Fenton and coworkers (11) prepared dehydrated carrots in a number of ways and found riboflavin losses of 26 per cent in simmering 30 min.; 11 per cent in bringing to a boil (45 min.) and simmering 20 min.; 35 per cent in pressure steaming; and 39 per cent in boiling. In cooking dehydrated carrot bricks 45 per cent of the riboflavin was lost in bringing them to a boil (45 min.) and simmering 20 min. Hinman, *et al.* (17) found slight gains of riboflavin when canned carrots were heated in the concentrated canning liquor.

Pantothenic Acid. The literature available on the pantothenic acid content of carrots is at present scant. Values reported range from .12 mg. (23) to 3.2 mg. (1) per 100 gm. Pyke *et al.* (10) reported data on raw and cooked carrots which would indicate a loss of 17 per cent of pantothenic acid in cooking when calculated on a dry weight basis.

Biotin. Cheldelin and Williams (26) reported that 4 samples of carrots contained an average of .0025 mg. biotin per 100 gm.

EXPERIMENTAL PROCEDURE

Methods of Preparation

The general plan for this investigation was similar to that followed in a previous study on potatoes (27) except that boiling and steaming were the only methods of preparation studied. The methods of preparation were those used in the Army mess and other installations where large numbers are fed. In some installations carrots are prepared for cooking by peeling in a mechanical abrasive peeler, and in others they are cleaned with water and a stiff brush. Boiling is a common mess practice and steaming is typical in large restaurants and consolidated messes.

The plan of determining the batch weights at successive stages in the preparation was used as previously described (27). It was of particular value in the case of carrots since the leaching of solid matter was even more marked than in the case of potatoes. Determinations were made on a sufficient number of replicate samples, usually 10, to furnish data suitable for statistical analysis.

Study I

The carrots for this study were obtained from the general supply for the Pentagon Post Restaurants. The batches varied in size, depth of color, degree of maturity, freshness, and variety.

Samples were prepared of: unpeeled carrots, raw; and of peeled carrots, raw; boiled; boiled, held 1 hr.; steamed; steamed, held 1 hr. Water from the boiled carrots also was analyzed.

Raw carrots for one day's analysis were sorted by setting aside every 10th carrot for the raw unpeeled sample. These unpeeled carrots were washed by hand, trimmed of tops and roots, and sliced into disks in a mechanical vegetable slicer with blades set at $\frac{3}{8}$ in. This sample was thoroughly mixed and used immediately for preparation of subsamples. This mixing and immediate subsampling was the general practice for all raw samples. The remaining carrots, approximately 45 lb., were peeled in a mechanical abrasive peeler for 2 min. and then drained. The machine did not peel unsound carrots; therefore these could be detected and discarded. Green and purple epidermis and woody stalk parts were removed. The peeled carrots were then sliced by the machine into one large container and slices from every part of the container were used for the raw peeled samples and for the various cooking procedures.

For boiling, about 25 lb. of peeled carrot slices were placed in a 20-gal. tinned iron pot (small areas of iron were usually exposed), and covered with boiling water. The water was then brought back to a vigorous boil, 100 gm. of sugar and 100 gm. of salt were added, and the boiling continued until the carrots were tender, usually 45 min.

For steaming, approximately 6 lb. of the peeled carrot slices were placed in 1-gal. stainless steel pans and cooked in a free-venting vegetable steamer until tender, usually 25 min.

For holding, quantities of the boiled or steamed slices were placed in 1-gal. stainless steel pans and kept on the steam table for 1 hr.

Study II

To eliminate some of the variables obtained in the first study, a second study was made with carrots of a single purchase-lot, and of a single variety. Twelve crates of the *Chantenay Coreless* variety were obtained from a producer in the Imperial Valley, California. The carrots were received in prime condition. After storage for one week, it was necessary to remove the tops from all the remaining carrots to reduce wilting and deterioration from fungus diseases. Sixty lb. of carrots were used for each analysis, approximately 5 lb. being taken from each of the 12 crates.

The carrots were cleaned in water with a stiff brush, and after removal of any green epidermis and, without previous peeling, were sliced in the mechanical slicer. The method of distribution of slices and the subsequent cooking procedures were the same as in Study I except that no sugar or salt was added. Samples were prepared as in Study I except that there was no sample for raw, unpeeled.

Study III

The remaining *Chantenay Coreless* carrots (266 lb.) were used for a special study on the relationship of carotene content to the physical characteristics of raw carrots. These carrots were separated into 3 groups according to weight, and a sample from each group prepared for carotene analysis.

In addition, 50 medium sized carrots were arranged according to the depth of external coloring. The two darkest, the two lightest, and the two of middle coloring were assayed individually for carotene content.

Analytical Procedures

Carotene was determined by the method of Ben-Dor, *et al.* (28). Carotene as determined by this method is approximately equivalent to "pure" carotene as determined by the A.O.A.C. method.

Biotin and *pantothenic acid* determinations were made at the Department of Biochemistry, University of Wisconsin, on composites prepared from the replicate B-complex samples. Biotin was assayed according to the procedure of Shull, *et al.* (29) using the modified basal medium of Shull and Peterson (30). The samples were hydrolyzed for assay by autoclaving with 4N H_2SO_4 for 2 hr. at 15 lb. pressure. Extracts for pantothenic acid assay were prepared and assayed according to the procedure of Neal and Strong (31) with the modifications introduced by Ives, *et al.* (32).

Other analyses included determinations of dry solids, hydrogen ion concentration, total and dehy-

droascorbic acid, niacin, thiamin, and riboflavin. The methods used were similar to those previously described (27) with the following exceptions: (a) the incubation period for niacin and riboflavin cultures was uniformly 72 hr., and (b) the riboflavin extracts were prepared by autoclaving the subsamples in the presence of 1 N H_2SO_4 at 15 lb. for 30 min.

Subsamples for Analysis

All subsamples for vitamin assay except those from the boiling water samples were prepared for analysis by slurrying with a stabilizing solution in a Waring Blendor, and were stored in brown glass bottles in a refrigerator room maintained at 40°F.

There are considerable variations in vitamin content between the inner and the outer parts and among top, middle and bottom portions of the carrot. This fact and variations among individual carrots, made it essential that subsamples represent as many slices as possible. For the subsamples of the raw carrots, large numbers of slices were selected at random from the entire sample. The slices were halved crosswise to give comparable subsamples for the assay of total and dehydroascorbic acid. In the case of the cooked carrots, ascorbic acid subsamples were prepared as for the raw. The remainder of the cooked sample was chopped thoroughly with a knife and mixed before aliquots were taken for the other subsamples.

Subsampling for ascorbic acid assays was completed within 15 min. of the time the samples were

TABLE 1

Vitamin content of raw carrots, those cooked by large-scale methods, and percentage retentions of vitamins in the cooked carrots

DESCRIPTION OF SAMPLES	BATCH WEIGHT	DRY SOLIDS	pH	VITAMIN CONTENT*					PERCENTAGE VITAMIN RETENTION**					
				Carotene content	Ascorbic acid		Niacin	Thiamin	Riboflavin	Carotene retention	Ascorbic acid		Niacin	Thiamin	Riboflavin
					Total	Reduced					Total	Reduced			
	units	%		*mg./100 gm.*						%	%	%	%	%	%
Carrots, miscellaneous varieties (Study I)															
Raw, unpeeled	120.0	13.0 12.3–14.1	6.2 5.7–6.6	11.0 9.9–12.5	5.8 5.1–6.8	5.1 4.1–6.3	.95 .69–1.46	.069 .057–.083	.052 .041–.070	127	127	130	149	140	140
Raw, peeled	100.0	12.3	6.3	10.5	5.5	4.8	.71	.060	.046	100	100	100	100	100	100
Boiled	93.7	9.4	5.9	10.6	1.7	1.2	.45	.032	.033	96	27	21	53	50	66
Boiled, held 1 hr.	99.9	9.0	5.9	10.2	1.4	.7	.44	.031	.031	97	25	14	54	52	68
Boiling water	113.6	4.8	5.8	.1[a]	.8	—	.37	.023	.023	1	16	—	51	42	56
Steamed	89.4[b]	12.3[b]	5.9[b]	—	3.6[b]	2.9[b]	.62[b]	.050[b]	.045[b]	—	62	56	84	82	92
Steamed, held 1 hr.	90.4[b]	12.9[b]	5.8[b]	—	3.4[b]	2.0[b]	.62[b]	.047[b]	.043[b]	—	60	40	88	78	89
Carrots, Chantenay coreless (Study II)															
Raw, unpeeled	100.0	12.5 12.0–13.0	6.1 6.0–6.3	8.4 7.4–9.6	6.3[c] 5.8–6.6	5.7[c] 5.1–6.1	.64 .57–.70	.066 .063–.069	.062 .054–.068	100	100	100	100	100	100
Boiled	91.9	9.5	6.0	8.7	2.8[c]	2.2[c]	.40	.044	.047	95	42	35	57	56	70
Boiled, held 1 hr.	95.4	9.3	6.0	8.4	2.4[c]	1.2[c]	.38	.040	.045	95	36	21	57	58	70
Boiling water	81.7	5.0[c]	5.8[c]	0.1[d]	1.8[c]	—	.33[c]	.030[c]	.031	1	27	—	44	38	42
Steamed	90.7	12.6	6.1	8.7[d]	4.4[c]	3.8[c]	.62	.061	.062	93	63	62	88	84	92
Steamed, held 1 hr.	91.0	12.6	6.0	8.7[d]	3.8[c]	2.4[c]	.60	.062	.063	93	55	38	86	85	92

* Values are averages of results from a number of replicate batches—usually 10–14. Averages based on less than 10 replicates are indicated as follows: a, 6 replicates; b, 4 replicates; c, 9 replicates; d, single samples composited of aliquots from the subsamples of various runs; e, 8 replicates.

** Per cent retention in the stored carrots (Study I) was calculated on the basis of the raw peeled as 100; in the case of the fresh carrots (Study II), the raw unpeeled was used as 100. The percentage retention values presented are averages of percentage retentions calculated individually from results for each batch.

received in the laboratory. Subsamples of carrots for the determination of *total ascorbic acid* were made by slurrying 60 gm. of carrot and 180 ml. of 5 per cent metasphosphoric acid. For the subsample of boiling water, 150 ml. of the water and 50 ml. of 20 per cent metaphosphoric acid were used. Sixty gm. of carrot and 180 ml. of 5 per cent metaphosphoric acid containing 1 per cent thiourea were used in preparation of the *dehydroascorbic acid* subsamples. Ascorbic acid assays were made within 24 hr. after preparation.

Subsamples for the determination of *niacin, thiamin*, and *riboflavin* were made by slurrying 150 gm. carrot with 300 ml. 0.1 N H_2SO_4. For the subsamples of boiling water, 270 ml. of the water and 30 ml. of 1 N H_2SO_4 were used. A small amount of chloroform was added to the vitamin B complex subsamples. Composite subsamples for the determination of *pantothenic acid* and *biotin* were prepared for each stage of preparation by pooling 30 gm. of slurry from each of the 10 replicate vitamin B complex subsamples for that stage.

Subsamples of raw and cooked carrots for *carotene* analysis contained 100 gm. of carrot slurried with 400 ml. of 3 per cent KOH in 32 per cent ethanol. These preparations were of such a consistency that representative aliquots for assay could be taken with a calibrated inverted pipette. Subsamples of boiling water contained 150 ml. of the water and 150 ml. of 3 per cent KOH in 32 per cent ethanol.

Subsamples for the determination of percentage *dry solids* were made by slurrying 75 gm. carrot with 150 ml. distilled water. The boiling water was not diluted. *Hydrogen ion concentration* was determined on portions of the dry solids subsamples.

RESULTS

Data on vitamin content, dry solids and hydrogen ion concentration of carrots at all stages of preparation in each of the first two studies are summarized in Tables 1 and 2. For the raw, unpeeled carrots a range as well as the average is given. Percentages of vitamin retention in the carrots at the different stages of preparation also are presented in Tables 1 and 2. These percentages are the averages of the percentage retentions calculated for individual batches, (27). Since in Study I carrots were peeled before cooking, the retention percentage in that study was calculated on the basis of the raw peeled carrots as 100. In Study II the carrots were cooked without peeling, and raw, unpeeled was used as 100.

Differences between percentage values for the stages and methods of preparation were calculated (Table 3) to determine the relative effects of peeling, boiling, steaming and holding. The significance of each difference was assessed by comparison with the least significant difference (95 per cent) calculated according to Student's t method (27).

The *mechanical peeling* of carrots brought about significant decreases in concentration of carotene, total and dehydroascorbic acid, niacin, thiamin, and riboflavin. On the basis of 100 per cent for the unpeeled, the percentage concentration in the peeled was: for carotene, 95.5 per cent; total ascorbic acid, 94.8 per cent; reduced ascorbic, 94.1 per cent; niacin, 74.7 per cent; thiamin, 86.9 per cent; and riboflavin, 88.5 per cent. Niacin, thiamin and riboflavin are apparently more highly concentrated in the portion removed by peeling. Decrease in weight from peeling the stored carrots (Study I) was 16.7 lb. per 100 lb.

Boiling resulted in highly significant losses of ascorbic acid, niacin, thiamin and riboflavin. For the two studies the losses were as follows: total ascorbic acid, 73 and 58 per cent; reduced ascorbic acid, 79 and 65 per cent; niacin, 47 and 43 per cent; thiamin, 50 and 44 per cent; and riboflavin, 34 and 30 per cent. Loss[2] of pantothenic acid was 46 per cent and of biotin 18 per cent (Study II). Carotene losses were small in both studies and only one loss was significant, that of 5 per cent in Study II.

TABLE 2

The biotin and pantothenic acid content and percentage retention of Chantenay coreless carrots, raw and cooked by large-scale methods

DESCRIPTION OF SAMPLES	VITAMIN CONTENT*		VITAMIN RETENTION	
	Pantothenic Acid	Biotin	Pantothenic Acid	Biotin
	mg./100 gm.	*mg./100 gm.*	%	%
Raw, unpeeled	.22	.0018	100	100
Boiled	.13	.0016	54	82
Boiled, held 1 hr.	.15	.0016	65	85
Boiling water	.11	.00065	41	29
Steamed	.26	.0019	107	96
Steamed, held 1 hr.	.20	.0020	83	101

* Results are for samples composited of aliquots from the single subsamples in successive sets of samples.

For the first two studies, the water in which the carrots were boiled contained respectively: 16 and 27 per cent of the total ascorbic acid, 51 and 44 per cent of the niacin, 42 and 38 per cent of the thiamin, and 56 and 42 per cent of the riboflavin present in the raw carrots. The boiling water also contained 41 per cent of the pantothenic acid and 29 per cent of the biotin present in the raw carrots. It is apparent, therefore, that vitamin losses in the boiling of carrots are due largely to extraction by the cooking water.

Steaming also resulted in highly significant losses of total and reduced ascorbic acid. For the first two studies the losses were 38 and 37 per cent for total ascorbic acid and 44 and 38 per cent for reduced ascorbic acid. Losses of niacin and thiamin were significant in both studies but not as great as those of

ascorbic acid. The losses were 16 and 12 per cent for niacin and 18 and 16 per cent for thiamin. Losses of riboflavin were small and significant only in Study II—8 per cent. Pantothenic acid showed a gain of 7 per cent; biotin a loss of 4 per cent and carotene a loss of 7 per cent.[2]

A comparison of the percentage retentions for boiled carrots with those for steamed carrots shows that the steamed carrots retained a much higher percentage of all vitamins studied than did the boiled carrots. In the two studies the steamed carrots retained 35 and 21 per cent more total ascorbic acid, 35 and 27 per cent more reduced ascorbic acid, 31 and 31 per cent more niacin, 32 and 28 per cent more thiamin, and 26 and 22 per cent more riboflavin. Retention of pantothenic acid was 53 per cent greater, and of biotin 14 per cent greater in the steamed than in the boiled carrots.[3] Retention of carotene was practically the same for steaming and boiling—93 and 95 per cent.

Holding cooked carrots on the steam table for 1 hr. resulted in significant decreases in ascorbic acid content only. Boiled and steamed carrots lost respectively, 6 and 8 per cent of total ascorbic acid (Study II); losses of reduced ascorbic acid were 7 and 16 per cent in Study I and 14 and 24 per cent in Study II.

In carrots cooked or cooked and held, dehydroascorbic acid comprises a greater proportion of the total ascorbic acid present than in raw carrots; the percentage losses of reduced ascorbic acid from cooking and holding were always greater therefore than those of total ascorbic acid. In the case of *Chantenay Coreless* carrots cooked and held 1 hr. the actual content of dehydroascorbic acid was greater than in the original raw carrots.

Since the various carotene fractions have different biological values as sources of vitamin A., the carotene from one set of samples of raw and cooked carrots was fractionated into alpha and beta-carotene. The carotene of raw carrots was 22 per cent alpha and 78 per cent beta-carotene. The carotene

[2] Significance of these losses could not be determined since the assays for each stage were made on single samples composited of aliquots from the replicate samples.

[3] Significance of these losses could not be determined since the assays for each stage were made on single samples composited of aliquots from the replicate samples.

TABLE 3

Differences in per cent vitamin retentions between stages in the large-scale boiling and steaming of carrots, with a test of their significance*

DESCRIPTION OF SAMPLES	BATCH WEIGHT DIFF.	CAROTENE		ASCORBIC ACID				NIACIN		THIAMIN		RIBOFLAVIN	
				Total		Reduced							
		Diff.	l.s.d.†	Diff.**	l.s.d.†	Diff.	l.s.d.†	Diff.	l.s.d.†	Diff.	l.s.d.†	Diff.	l.s.d.†
Carrots, miscellaneous varieties (Study I)													
Raw, unpeeled—raw peeled	−20.0	*−27*	12	*−27*	9	*−30*	13	*−49*	10	*−40*	12	*−40*	9
Raw, peeled—boiled	−6.2	−4	10	*−73*	5	*−79*	7	*−47*	4	*−50*	5	*−34*	5
Raw, peeled—boiled plus boiling water		−3	—	*−57*	6	—	—	−4	8	*−8*	5	*22*	3
Boiled—boiled, held	6.2	1	—	−2	5	−7	6	1	—	2	6	2	—
Raw, peeled—steamed	−10.6	—	—	*−38*	11	*−44*	13	*−16*	15	*−18*	6	−8	16
Steamed—steamed, held	1.0	—	—	−2	—	*−16*	13	4	—	−4	9	−3	—
Steamed—boiled	—	—	—	*−35*	9	*−35*	13	*−31*	7	*−32*	8	*−26*	11
Steamed, held—Boiled, held	—	—	—	*−35*	10	*−26*	13	*−34*	7	*−26*	9	*−21*	9
Carrots, Chantenay coreless (Study II)													
Raw—boiled	−8.1	*−5*	4	*−58*	5	*−65*	6	*−43*	2	*−44*	3	*−36*	6
Raw—boiled plus boiling water	—	−4	—	*−31*	7	—	—	1	3	*−6*	3	*12*	5
Boiled—boiled, held	3.5	0	—	*−6*	4	*−14*	3	0	2	2	3	0	3
Raw—steamed	−9.3	−7	—	*−37*	7	*−38*	10	*−12*	3	*−16*	2	*−8*	3
Steamed—steamed, held	.3	0	—	*−8*	5	*−24*	7	−2	5	1	2	0	3
Steamed—boiled	—	—	—	*−21*	4	*−27*	6	*−31*	4	*−28*	3	*−22*	4
Steamed, held—boiled, held	—	—	—	*−19*	4	−17	5	*−21*	4	*−27*	3	*−22*	4

* Differences were derived from percentage vitamin retention values given in Table 1.

** Differences as great as or greater than the value calculated as the least significant difference are considered as significant. These are *italic*. A negative sign is used when the vitamin content of the first stage is greater than that of the second stage; no sign is used when the reverse is true.

† See text for method by which the least significant difference (95 per cent) is calculated.

of the cooked carrots gave values of 19 to 22 per cent alpha and 81 to 78 per cent beta-carotene, indicating no significant difference in the proportion of these two components in the raw and cooked carrots.

The carotene content of the carrots of the same variety grouped as small, medium and large, did not vary greatly being 7.0, 7.8, 8.3 mg. per 100 gm.

On the other hand, the depth of external coloring was a good index of the carotene content of individual carrots. The two "dark orange" carrots analyzed contained 12.6, and 13.4 mg. of carotene per 100 gm. The two samples of medium color contained 8.0, and 11.0 mg. of carotene per 100 gm., and the pale orange samples 6.8 and 8.0 mg. per 100 gm.

Discussion

The data presented show that carrots cooked by boiling or steaming retain practically all of their original carotene and are thus to be considered at least as valuable as raw carrots as a potential source of vitamin A.

Steaming of carrots results in a markedly greater retention of ascorbic acid, niacin, thiamin and riboflavin than does boiling; the loss of solids is also much less in steamed than in boiled carrots. In addition, steamed carrots have better flavor, brighter color and a more pleasing texture.

Vitamin retentions in the peeled and cooked carrots representing *stored* carrots of several varieties (Study I) and in the unpeeled and cooked *fresh Chantenay Coreless carrots* (Study II) showed close agreement. Significant differences between corresponding values from the studies existed only in the case of thiamin retentions for carrots boiled and held and of riboflavin retentions for the boiled carrots plus the boiling water. From these results it is apparent that vitamin losses due to cooking *peeled stored carrots* are similar to those due to cooking of *unpeeled fresh* carrots.

Summary

A study was carried out for the purpose of determining vitamin content and percentage retention of vitamins in raw carrots and those cooked by large-scale methods. The effect of holding the cooked carrots on a steam table for 1 hr. was studied. Calculations of percentage retention were made on the "batch weight" basis. Differences in retention between the several stages and between the two methods of cooking were statistically examined for significance.

Vitamin content of the raw unpeeled carrots varied moderately in the several miscellaneous varieties but only slightly in the ten batches of the *Chantenay Coreless* variety. Averages of the individual values from the two studies and the range in mg. per 100 gm. were respectively as follows: carotene, 9.7 and 7.4 to 12.5; total ascorbic acid, 6.0 and 5.1 to 6.8; reduced ascorbic acid, 5.3 and 4.1 to 6.3; niacin, .82 and .57 to 1.46; thiamin, .068 and .057 to .083; riboflavin, .056 and .041 to .070; pantothenic acid, .22 (no range); and biotin, .0018 (no range). The concentration of niacin, thiamin, and riboflavin was markedly greater in the portion removed by peeling.

Destruction of ascorbic acid was marked whether carrots were boiled or steamed. The retention of ascorbic acid in steamed carrots was more than double that in boiled carrots. There was additional destruction of ascorbic acid on holding the cooked carrots on the steam table 1 hr. The proportion of dehydroascorbic acid increased during cooking and holding.

Retentions of the B complex vitamins studied (niacin, thiamin, riboflavin, pantothenic acid, and biotin) were correlated with their solubilities in water. Steamed carrots retained 82 per cent or more of these vitamins; boiled carrots, 50 to 80 per cent. Most of the vitamins "lost" in boiling were found to be in the cooking water.

Holding of the cooked carrots on the steam table 1 hr. resulted in little or no loss of the B vitamins or carotene. Retention of carotene in cooked carrots was almost complete—93 to 96 per cent. Unpeeled fresh carrots and peeled stored carrots on cooking showed similar retention of vitamins. The depth of external coloring was a good index of carotene content.

From the standpoint of flavor, aroma, consistency, and appearance as well as retention of the water soluble vitamins and solids, steaming is recommended as superior to boiling for the preparation of carrots. It is also recommended that, when possible, raw carrots be prepared for cooking without peeling.

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PROSTIGMIN VALUABLE IN SPASTIC PARALYSIS

PROSTIGMIN may well be a valuable adjunct to therapy in spastic paralysis, according to a study based on a small series of cases, reported by Dr. Paul N. Jepson in the January, 1946 issue of the *Journal of Pediatrics*. In this disease the therapeutic resources of the physician were formerly limited to muscular training, and various physiotherapeutic measures. Since the results of such treatment were highly unsatisfactory, the therapeutic efficacy of prostigmin in this disorder is especially significant. According to Dr. Jepson, prostigmin "aids materially by decreasing or abolishing muscle spasticity, thus helping the patient to relax sufficiently to allow slow, controlled movement of the extremities."

Dr. Jepson, who began the use of the drug in 1943, employed it in 25 patients and found that "the results have been most encouraging." Favorable results often were noted within 2 or 3 weeks after the beginning of treatment but medication has to be continued for at least 6 months. Other forms of therapy, such as muscular re-education, must be employed concurrently if the most favorable end results are to be obtained. The author noted that frequent small doses of prostigmin bromide provide a more pronounced decrease of muscle spasm than do larger doses given less often. While the drug proved highly effective in patients under 12 years of age, it did not affect the disease in 2 adults.

Although no definite conclusion should be based on so few cases, it is believed that continued use of prostigmin may enable investigators to compile results and data as a basis for developing standardized technic.

Editorial

AN APPRECIATION

Mary Pascoe Huddleson will always be associated with the JOURNAL OF THE AMERICAN DIETETIC ASSOCIATION. Though she has resigned as its editor, she will never be forgotten for her contribution to our professional publication and to the profession itself.

Mrs. Huddleson became editor when the JOURNAL was an infant only 2 years old and she has guided it with loving care throughout its childhood and adolescence, until now, after 19 years, she is turning over to her successor a sturdy adult publication, accepted throughout the scientific and professional world. Everyone in the profession appreciates the years of hard work that she gave to the JOURNAL. All are proud of the publication and realize how much it has contributed to the development of the profession.

Mrs. Huddleson has inspired the loyal support of the many dietitians who have been associated with her on the JOURNAL Board and staff. They all regret her decision to give up the responsibility she carried so faithfully for nearly two decades.

The history of the JOURNAL, which antedates Mrs. Huddleson's piloting by only a short while, shows the farsightedness of the Association's officers. In 1923, when the Association was only 5 years old, the Executive Board decided that the organization needed a publication. The Chicago Dietetic Association, the one group of dietitians publishing a bulletin, was asked by the national organization to allow its August issue to be used as a preconvention bulletin, to which association activities and convention news might be added. This small bulletin greatly stimulated interest among the members so that the following year 4 of the Chicago Association bulletins appeared as a National Association quarterly. Emma B. Aylward served as its editor.

When Dr. Ruth Wheeler became president in 1924, she saw the need for a more professional type of publication. Though funds were limited, courageous plans were made for a quarterly journal which modestly made its appearance in June 1925 under the guidance of Florence H. Smith. One has only to look through the 553 pages of volumes 1 and 2 to see the firm foundation established for the JOURNAL. Names of great importance in our own and allied professions appear in those early issues. A few of them are Malcolm T. MacEachern, Mary Swartz Rose, Russell M. Wilder, Agnes Fay Morgan, S. S. Goldwater and Abby Marlatt.

In the fall of 1926 Miss Smith acceded to the presidency of the Association and resigned as editor of the JOURNAL. After a thorough sifting of the members to find the right person, Mrs. Huddleson was chosen and she assumed her editorial duties with the November 1927 issue.

After one year as editor Mrs. Huddleson began to see the possibilities for the expansion of the JOURNAL. In her 1928 report she outlined the needs of the JOURNAL as follows:

> A high standard of copy.
> A greater diversity of material.
> Accuracy and greater care in the preparation of scientific papers because many readers accept the statements of contributors as coming officially from the Association.
> A JOURNAL Board to advise the editor.
> Assistant editors to whom the editor may assign specific work, such as the preparation of a current comment section and a complete bibliography of current literature with short abstracts of outstanding articles.

Subsequent reports show that the needs as set forth in this report have been the goal constantly kept before the Association by Mrs. Huddleson, who believes that the JOURNAL is "not only a forceful means of keeping our best foot forward, it is also our best over-all means of welding a strong unified professional solidarity."

Reading Mrs. Huddleson's reports, one is impressed by the fact that the JOURNAL has traveled a long way toward the goal that she set. Consider the progress of the JOURNAL.

The size of each issue of the JOURNAL as well as the number of issues has shown a constant growth. From 1925 to 1932 it was a quarterly publication. Beginning with volume 8 and continuing through volume 13 (1933–1937) it appeared bi-monthly. Then for 4 years (1938–1941) there were 10 issues a year. And since 1942 it has been a monthly publi-

cation. Thus Mrs. Huddleson had realized the hope expressed by the president and editor in the first issue that with membership support the JOURNAL "may in time grow into a monthly."

The size of the volumes has increased more than 400 per cent, volume 16 containing more than a thousand pages as compared with the first volume of 223. With the change in format in 1942 it was possible to increase the amount of copy on a page as much as 70 per cent, so that even with a somewhat reduced number of pages the JOURNAL actually gave its readers 50 per cent more material.

The JOURNAL's circulation has shown a steady upward trend due not only to the increase in the number of Association members who automatically receive it, but to an ever enlarging number of nonmember subscriptions. In 1925 the first issues went only to the 1,200 members. Today the circulation includes not only the 7,500 members to which the JOURNAL goes as "an extra dividend over and above other Association services," but to an additional 2,000 nonmember subscribers. Income from this latter group increased 400 per cent in the ten-year period 1934–1944.

The development from the modest official publication of a young struggling association, to the present widely recognized professional journal, without doubt has been due to the untiring efforts of its editor. Mrs. Huddleson served without salary through those early financially unstable years. In 1931, for example, the miscellaneous expenses outside of the actual printing and distribution of the JOURNAL amounted to only $164. In 4 years the yearly deficit was cut from $1762 for the 530-page volume 5 to $84 for the 537-page volume 9. From that to the balance of more than $18,000 for the 717-page volume 21 is a long way.

Other great steps in the progress of the JOURNAL are shown in the changes in format—from a conservative gray cover with its small size page to the larger publication with its present colorful but dignified cover. The first change in 1938 was to a green and gold cover. Mrs. Huddleson commented on this change which "must have seemed gaudy, if not giddy attire after 12 years' Quaker-like restraint." She explained that the new cover was merely a "concession to the demands of an age dedicated to surface appeal." In 1942 the JOURNAL again changed to "meet the needs of the times" to the large page publication with its present cover. One volume now requires 25 tons of paper or more than 2 tons for each issue.

The war with its paper shortage brought new complications to the JOURNAL editor. The need for publishing important scientific findings and additional food and nutrition items, as well as meeting an increased circulation, added problems which Mrs. Huddleson, as usual, solved. Smaller margins and type, condensation of material and other adjustments all added to her work, but kept up the JOURNAL's standard of service to the profession. Mrs. Huddleson once said that "mere growth in size, however, is not the sole index to advancement, either nutritionally or journalistically." She believed it was essential that more and more articles should be written by members of the profession. In an effort to inspire the dietitians to do this she said, "It is incumbent that we permanently discard a too juvenile approach in our thoughts and our words so far as they appear in published form."

Several years later she told with great satisfaction that far more papers were being written by members of the Association. Of the 60 original papers in the first 2 volumes about half were written by doctors and nurses. Volume 10 represented the work of 51 authors, 30 of whom were women belonging to the dietetic profession. Four years later 75 of the 100 original articles published that year were by members of the Association. She said, "Very soon now we shall be able to say that the Association's JOURNAL, from cover to cover, is not only for, but also by, members of the American Dietetic Association."

The standing of the JOURNAL scientifically and professionally is evidenced by the fact that its contents are routinely listed and many articles are abstracted in publications such as *Nutrition Abstracts and Reviews* and *The Journal of the American Medical Association.*

Another indication of the place the JOURNAL has taken in the scientific and professional world is shown in many ways. It has been sent to South America, New Guinea, France and India. The armed forces appealed for qualified women to serve in World War II through its pages. The Department of State requested permission to microfilm copies of the JOURNAL to be sent to India and the Near East to be used in their program of technical and cultural assistance to those countries.

When explaining the influence of the JOURNAL in foreign countries, Mrs. Huddleson said that like a well-known paint, it can be said to "cover the globe."

Those attending conventions will miss Mrs. Huddleson's reports. In addition to the business reports with a note of inspiration in them she always added a charming touch of whimsey. To recall a few of these:

In describing the change in format she said, "Change in format, then, along with appropriate change in editorial policy, unquestionably brings the JOURNAL out of its, shall we say, past neutrality, once enveloped in a 'take it or leave it' Quaker gray, into the open market as attractive food and equipment advertising media."

In trying to stimulate writing activities among the members of the Association she once stated, "There have been faint stirrings and portentous rumblings now and then, but to date there have been no mass

attacks upon pen and paper on the part of more than 3,000 dietitians. Not until we have roused our now dormant writing abilities shall we have a journal truly representative of our profession."

In discussing the object of the JOURNAL (the advancement of the profession) and the practical side of the publication she said, "And so, while we walk the editorial tightrope of immediate practicality, and advance as it implies 'a furnishing of money' and 'to prosper,' we will carry a balancing parasol of other kinds of advancement sufficient, we hope, to forestall a sudden drop into the sawdust of a scientific and professional nonentity."

Mrs. Huddleson, your co-workers wish you the greatest of happiness and success in whatever you undertake. We also are grateful to you for all that you have contributed to our JOURNAL and to our profession. The future editorial staff will heed your warning "that no publication can rest on its oars—it must go forward or it will slide back." They will make every effort to "be alert and sensitive to change—conservative perhaps, yet never timid or uncertain." Undoubtedly they will, as you so aptly put it, "bark their shins on unsuspected rocks every day" as they struggle "for the distant goal of a JOURNAL worthy of this Association and what it stands for." They will remember, however, your inspiring quotation that "a man's reach should exceed his grasp, or what's a heaven for?"—*Anna E. Boller.*

Food and Agriculture Organization Calls Meeting on Urgent Food Problems

A meeting was held May 20 in Washington on urgent food problems. In telegrams to the President of the Assembly and the Secretary General of the United Nations, Sir John Orr offered the services of FAO, as the only organization concerned with all aspects of food and agriculture on a world scale, to head the work. It was agreed that FAO was not in a position to do anything effective about the immediate situation this spring, which in any case is being handled by UNRRA, the Combined Food Board, and other organizations, but that it could step in in time to be of use a little later. Informed opinion agrees that, whatever the outcome of this year's harvests, the food situation will still be acute next winter and possibly the winter following.

Other international agencies dealing with food are temporary and limited in functions or geographical coverage or both. It was agreed that FAO is the logical agency to bring them together and to obtain general agreement among the governments of the principal countries concerned.

The purpose of the May meeting was:

(1) To assess the present food position and the prospects for 1946–47. On this it is hoped to obtain general agreement which may eliminate some of the confusing information that has appeared in the past.

(2) To decide on practicable measures for assuring the most effective distribution and use of available supplies. This might involve decisions regarding, for example, the line to be drawn between the use of grain for direct human consumption and for livestock feeding.

(3) To determine practicable measures for increasing supplies for next winter and also for the winter of 1947–48. This would involve consideration of production goals during the next year.

(4) To work out means whereby FAO can keep the world food position under continuous review and report thereon to governments. This will involve continuing close cooperation with existing bodies and coordination of the facts and figures they assemble.

(5) To consider means for better coordination of the activities of all of the existing organizations.

The Director-General made it clear that FAO will not take on the direct distribution of relief or other executive functions. Under its Constitution, it is essentially an investigative, advisory, and coordinating body, and it will act in this capacity for the temporary international agencies concerned with food and agriculture, as well as for governments.

A meeting was arranged by the Director-General of FAO for a number of experts to meet in London April 10 to advise on the setting up of permanent services dealing with statistical and scientific information. The chief questions up for discussion were the FAO library and bibliographic services and their relationship to the work of existing organizations; how the present scientific abstracting and reviewing services of the world can best be brought into relationship with the work of FAO; arrangements between FAO and government statistical agencies for cooperation in the building up of an adequate world-wide statistical service. —*From FAO Information Service Bulletin, I. S. B. 2.*

Current Comment

THE PRODUCTION AND DISTRIBUTION OF FOOD TO AMERICAN RED CROSS CLUBS IN THE NAPLES REGION

LEVELLE WOOD[1]

The American forces were a well-fed group of men and women, but regardless of location, that extra "bit" of food meant much to them. In Italy there were no corner drug stores as we know them; in fact, there were few civilian places where men could go for refreshments. Therefore, they were dependent on army sponsored clubs, PX refreshment bars, and the American Red Cross club and clubmobile units for between meal feeding.

Food served in Red Cross clubs in Italy was limited to "recreational snacks" which were defined as simple pastries, ice cream, and beverages such as coffee, tea, and fruit drinks. Deviations were made for special occasions such as pumpkin pies for Thanksgiving, and sandwiches at a few summer beach clubs. Oftentimes birthday cakes and special pastries were featured in club programming. In the spring of 1945 as food items became more scarce, production was curtailed and serving hours shortened. In August 1945 we were limited to a doughnut, ice cream, coffee and lemonade operation, for which there no longer was a charge. The preparation of pastries and ice cream for such a set-up sounds perfectly simple and under circumstances to which most of us are accustomed it would be so.

Imagine yourself in Italy for a few moments as I attempt to give you a picture of how we supplied literally tons of cookies, cup cakes, and breakfast rolls, as well as thousands of gallons of ice cream to some 14 Red Cross club snack bars in the Naples, Caserta, and Capri area. My job was assistant to the director of food for this region. Much of the director's time was filled with securing equipment and helping to keep it repaired, and generally supervising the entire operation. Much of my time was spent in the office coordinating activities such as requisitioning food supplies, warehousing and sending them out to the bakeries and ice cream plants, scheduling transportation, and interviewing prospective employees for the Naples installations Such items as coffee, sugar, milk and lemon powder were sent to the clubs weekly. Many times the people in charge of the units were unaccustomed to quantity planning so guides were set up for the amounts of sugar and milk to order in relation to the amount of coffee. When canned milk was available in limited quantities, directions for combining powdered milk with it were supplied. The personnel in the clubs were most cooperative and appreciative of such aids and helped us through several shortage periods economically and with a minimum of complaints from the servicemen.

Monthly financial statements for all clubs, bakeries, and ice cream plants in the area were made in our office by civilian accountants, from reports sent by each unit. Estimates for the food needs for the following month were sent to the office of the Headquarters Food Supervisor by the 15th of each month. Quartermaster bills were checked and signed for the accounting department to pay. Periodic and emergency visits to all installations were made. You can see that ours was a busy and active assignment.

By the time the war was over we had enough ARC personnel that we could have a manager and an assistant manager in most installations to work with the civilian manager. Also. GI help was assigned as needed and schedules made so that at least one American person was on the premises at all times. This was highly desirable in a country where people were hungry, all foodstuffs limited, where sugar was $8.00 per lb. and even an empty flour sack sold for one dollar.

The amount of bakery production varied daily with the movement of troops in and out of the area. At peak times it might reach 80,000 pieces of pastry in Naples and 50,000 or more in Caserta. This would require approximately 100,000 lb. each of flour and sugar per month.

The main Red Cross bakery in Naples had been requisitioned a short time before we were assigned to the area in the late summer of 1944. It was considered one of the best bakeries in Naples before the war, yet there was no provision for hot water except a small tank on top of the electric oven in the basement with one outlet to a sink on that floor. There was no place to wash the wooden packing trays and soiled flour sacks used as aprons, except

[1]Associate Professor of Institutional Management at Kansas State College, Manhattan. Miss Wood spent 21 months overseas with the American Red Cross. Presented before the Indiana State Dietetic Association May 10, 1946.

on the open roof. Consequently this work was limited to sunny days.

As fast as possible the army engineers put a roof over the entire building for us. They also installed a double compartment sink and a water heating system using a GI fire unit. Plans were under way to install showers when one day one of the employees came and asked the Red Cross girl in charge if it might be arranged so that they could have one day off in 20 so that they could take a bath. Great was their surprise to find that they were scheduled for showers every day and that each person had soap and a towel to help along the good work.

As soon as the plant was cleaned so that it would pass military sanitary inspection as well as our own inspection, and when the employees were supplied clean aprons and caps every day, and daily quartermaster laundry service was established, the manager directed her efforts toward improvement of the products. Constant supervision was needed to teach the bakers to make our type of pastries and how to obtain the best results with the equipment and food supplies at hand. Many modifications, adjustments, and improvisions from our accepted practices and procedures had to be made, and an endless amount of patience and understanding was required.

The recipes used were familiar ones, adapted after experimentation. Some 12 or 15 recipes were changed to include powdered eggs, powdered or evaporated milk, and the weights and measures converted to the metric system. Then translations were made into the Italian language. Through the headquarters food office the recipes were charted for each 100 pieces up to 1,000 and for each 1,000 up to 10,000. These charts were used as partial controls on supplies sent to the bakeries and also in bakeries when checking supplies from the storerooms. Thus a recipe book was compiled and sent in mimeographed form to all American Red Cross bakery managers in the Mediterranean Theater of Operations. The resulting standardization of products throughout the theater or even in our own bakery was an improvement over the previous system but was less perfected than we might do here with more highly trained personnel and more easily controlled conditions.

It was difficult to get the Italian bakers to follow our recipes. Often too, it was necessary to make modifications for one reason or another. For example, the broken cookies were given to a charitable institution until it was discovered that the packers were given presents so that there would be more broken cookies. At that stage we began making crumb and jam filled cookies.

One of the common practices of the civilian workers was to overmix both cookie dough and cake batter. They also added flour to make them stiffer. Their standard for cake was a hard dry product which would be soaked in wine or sauce. Our standard was a product resembling our homemade items as much as possible. We probably came the nearest to that goal in chocolate iced cup cakes, oatmeal cookies, and apple turnovers. Sugar and fat shortages sometimes eliminated the first and last named so we would have to revert to very simple and plain products.

The problem of transportation also influenced the standard of product we could make. Only cookies or cakes of firm texture would arrive at a club in good condition after being transported in an army truck over rough streets or roads. At first we used shallow wood packing trays with fiber board sliding tops. These were unsatisfactory as they were hard to clean, were easily broken or mislaid, and too many cookies disappeared enroute. (Cookies sold for 20 cents each on the black market.) Finally, it was decided to try discarded metal ammunition boxes from the salvage dump. Many boxes had to be pounded into shape and the hinges repaired. Then they were cleaned, painted and labeled with the large ARC's and varnished inside and out. The result was well worth the time and effort spent. They looked wonderful and served the purpose well. Losses of both containers and pastries were reduced immediately.

The variety of products which could be made in any one bakery was dependent upon many things. Working space was usually limited as almost all Italian bakeries are small and planned primarily for breadmaking. Therefore, cooling and packing space for breakfast rolls, cookies, and cakes had to be planned carefully. Also the equipment was limited to ovens, work tables, and slow action power bread mixers. Both our electric and wood ovens had sloping floors so that sheet cakes were practically impossible. Not to be outdone, we had baking cups made from empty lard tins, No. 10 cans, and even milk cans, in which we made cup cakes. We tried to make three kinds of cookies each day, but the total production for any one day more or less determined the kind and variety of products which could be made. On those days when demands were greatest we necessarily had to have many plain sugar cookies which could be shaped with a cutter rolling pin and baked quickly. Another day we might have apple sauce cookies and twisted iced rolls.

The short list of food items available for purchase from the quartermaster imposed certain restrictions on the variety of products which we could make. We usually were able to obtain flour, sugar, powdered eggs, powdered milk, evaporated milk, baking powder, baking soda, yeast, salt, cocoa, lard, rolled oats, raisins, evaporated prunes and apricots, apple nuggets, ice cream mix, preserves, lemon extract, nutmeg, and occasionally a small amount of vanilla tablets and cinnamon. It was these flavorings and

spices we needed so much to give the "oomph" so necessary in good bakery products.

The second bakery in Naples was very small and really should be put in a museum. It was in a half-basement underneath an apartment building. Believe it or not, it had the same type of built-in oven one sees in the ruins of Pompeii. It took an expert attendant to operate it, for the fire was built in the oven, then raked out and the cakes put in. A few twigs were left burning in the side opening to maintain circulation and encourage the baking process. This procedure had to be repeated several times during the day. This bakery did have a small new electric oven on which we depended almost entirely. Water was heated in a can set on a GI fire unit and the waste from the sink had to be dipped from a tank located under the floor. The lovely marble topped work tables were outstanding.

A bakery at Capua was requisitioned and substituted for the one in Caserta about the time the war was ended. It was a more spacious set-up than the one in Naples and had two large tile coal ovens which any one of us would have been proud to own. The building had been bombed so required many repairs. The owner had been a horseman of note so stables were under the same roof, across a driveway from the bakery entrance. Part of this space was made into dressing and shower rooms for the employees.

At Capri an army field oven was used in a small one-room shop. Here the specialties were hand made doughnuts for the morning coffee hours and cookies for the remainder of the time.

Late last summer the large bakery was converted to a hand doughnut operation and a new place requisitioned in which we installed a battery of 6 electric automatic doughnut machines. There were problems involved but they had become rather commonplace and routine by that time. Motors had to be rewound or transformers installed as no American equipment could be connected directly to the 150-volt or higher voltage power lines.

Ice cream production was limited by the facilities available. We always made as much as possible each day but it never met the demand. Rarely would any club have enough to last longer than for a 2-hr. serving period.

Ice cream mix diluted with chlorinated water with the addition of fruits or other flavorings, made a very good quality product. Vanilla and chocolate were favorite varieties, but often we added orange marmalade, fruit cocktail, canned pineapple or peaches, or peanut butter. Our Fourth of July special was fresh apricot ice cream.

The freezing process in the Italian machines was slow and laborious. The machines heated up quickly so could not be operated continuously. A small amount of mixture was poured into revolving cylindrical wells set into refrigerated cabinets. An attendant scraped down the freezing mixture from the sides of the can with a long metal spoon, then transferred the semi-solid mass to storage cans to harden.

This ripening and temporary storage, and the packing for transportation when the machine was located outside the club, was a real problem. Some "beaten-up" dry ice packers had been secured at a high rental and we had to send a truck 12 miles to Pompeii every morning for dry ice. Our director devised a substitute by requisitioning metal from the engineers and engaging a local tinsmith to make and plate 4-gal. containers, with lids. Reclaimed, discarded insulated food containers were used for packers and a mixture of ordinary ice and rock salt replaced the expensive and inconvenient dry ice system.

At Capri we set up a small fountain where tasty malted milks were made by using a chocolate drink from cocoa beverage powder and chlorinated water, vanilla ice cream, and malted milk. We had regular fountain electric mixers and served the drinks in real glasses. Fruit jams and chocolate sauce were used for sundaes. A limited amount of chocolate sodas could be made and coca cola was plentiful. Needless to say this soda fountain was a popular spot.

Sanitation was always a great problem in both the production and service of food. All food service units were inspected monthly by the Army. Our standards of cleanliness seemed unreasonable to the civilian workers whose ancestors have survived centuries of insanitary surroundings. Soap had been a luxury for a long time and hot water seemed never to have been a necessity to them. Disease was common, especially tuberculosis, and the social and intestinal diseases. All food handlers were given a medical check by the army every 2 weeks and a blood test and stool analysis every 4 months. Resistance was low among the workers and absenteeism high.

Our type of work placed some of us in association with civilians most of the time though, of course, the set-up was for the interests of the American men and women in uniform. There was much satisfaction in seeing truck loads of good clean food go out to the clubs every day and later in visiting the clubs to observe how much enjoyment it gave. Some of our greatest thrills came when we served ice cream and cake to returning prisoners of war enroute home from German prison camps. Those fellows really enjoyed ice cream!

You may ask—was it *all* work? No, indeed. Often there were lighter moments with such recreation as sailing, dancing, and sight-seeing,—and if you have never tried it, drive a jeep for 50 miles or more over rough roads and see if you aren't ready for a good rest afterward.

An aversion to milk, or digestive upsets caused by the large, hard curds of untreated cow's milk, often make it difficult to insure adequate intake of this food so essential to child and adult nutrition. In such cases, "Junket" Brand Rennet Powder or Rennet Tablets "work magic" with milk. • By enzymatic action, rennet transforms milk into easily digested rennet-custards, which retain all the food values of milk—yet form small, soft curds in the stomach. • "Junket" Rennet Powder is already sweetened and comes in six natural flavors. "Junket" Rennet Tablets are not sweetened or flavored. Recommend either for making deliciously tempting rennet-custards. Full details and trial packages sent on request.

"THE 'JUNKET' FOLKS"
Chr. Hansen's Laboratory, Inc., Little Falls, N. Y.

"JUNKET" is the trade-mark of Chr. Hansen's Laboratory, Inc., for its rennet and other food products and is registered in the U. S. and Can.

NUTRITION PROBLEMS OF THE SHANGHAI INTERNMENT CAMPS

BERNARD E. READ,* M.D.

Reports regarding the nutrition of internees in the Far East have dealt particularly with conditions in South[1] and North China[2, 3]. The following account relates to Central China where 8 camps were established, the administration and activities of which were similar to those reported by W. H. Adolph.[2, 4]

The gradual and orderly internment of all the ordinary alien civilians in Shanghai was preceded by the arrest of several hundred men, leaders of various business and social groups, who were interned as political hostages. From this group information was gleaned as to the arrangements made by the Japanese for the feeding of all the local internment centers, and the author was enabled to make recommendations for the provision through the Red Cross of supplementary foodstuffs to make a more adequate diet.

The Japanese authorities made the following provision:

Per capita per diem

	gm.
Rice	240
Flour	270
Meat or fish	198
Vegetables	396
Sugar	15
Salt	12
Oil	9

This provided about 2400 calories.

Owing to the inability of the Westerner to eat so much rice, the ration of rice was cut to 180 gm. In the absence of baking facilities bread was provided instead of the same weight of flour. This reduced the total calories to about 1,800.

On occasions not all of these supplies were available, particularly over the New Year season. In addition to this, cuts in the meat ration were imposed as a punishment whenever fellow internees escaped from the camp.

The author spent about 15 months in a camp of about 2,000 men, women and children, and a further 15 months in a camp of about 350 sick and old people; referred to in this report as camps A and B.

Camp A was unusually well run and equipped by the internees. During the first 7 months conditions were quite tolerable. Like other camps people were more concerned about getting an adequate food supply than about anything else.

Beside the official rations the authorities allowed the individual to receive from an outside contact, with whom he had made his own financial arrangements, a monthly parcel of 10 lb. of food sent in through the Red Cross. The respective Governments granted a "comfort allowance" of about $8 per capita per month, paid into the Japanese bank through the Swiss Consul at an exchange rate settled by the Japanese. This rate was so low that for two long periods this comfort money was not drawn. With this money the various camps were able to buy supplementary foodstuffs and oddments for resale in the camps through canteens, on a bookkeeping basis. In addition, the International Red Cross arranged to send in bulk supplies of cracked wheat, millet, honey, peanut butter, soap, toilet paper and other necessities.

Mention also should be made of other minor sources of food. In Camp A the internees took in 1 cow, about 10 goats, 10 pigs and a few chickens. Gardens planted on about 1 acre of land provided fresh tomatoes, lettuce, beans, beets, and the like. Camp B was too small and congested to provide large gardens though 4 small plots were planted.

The needed supplementary foodstuffs were carefully studied. When available, bulk supplies of peanut butter, sesame butter, jam, lard, honey, eggs, dried fruit (Chinese dates) and occasionally fresh fruit, were purchased for resale in the canteen. Extra vegetables, potatoes, carrots, onions, and cabbage were purchased for the main kitchen in Camp A.

With these liberal supplements it was estimated that the individual calorie intake in Camp A at times attained a level of 3,000. This average was carefully computed from the actual amounts of food drawn from the main kitchen, from canned goods consumed in the billets based upon the number of empty cans from food parcels collected for resale, from food bought at the canteen and from the stocks of Red Cross supplies used. This calorie level however was far from constant, for at one time the official basic ration dropped to less than 1,600 calories and there were lean periods when without the comfort money the canteens did not operate, though at no time was the total average intake much less than 2,000 calories.

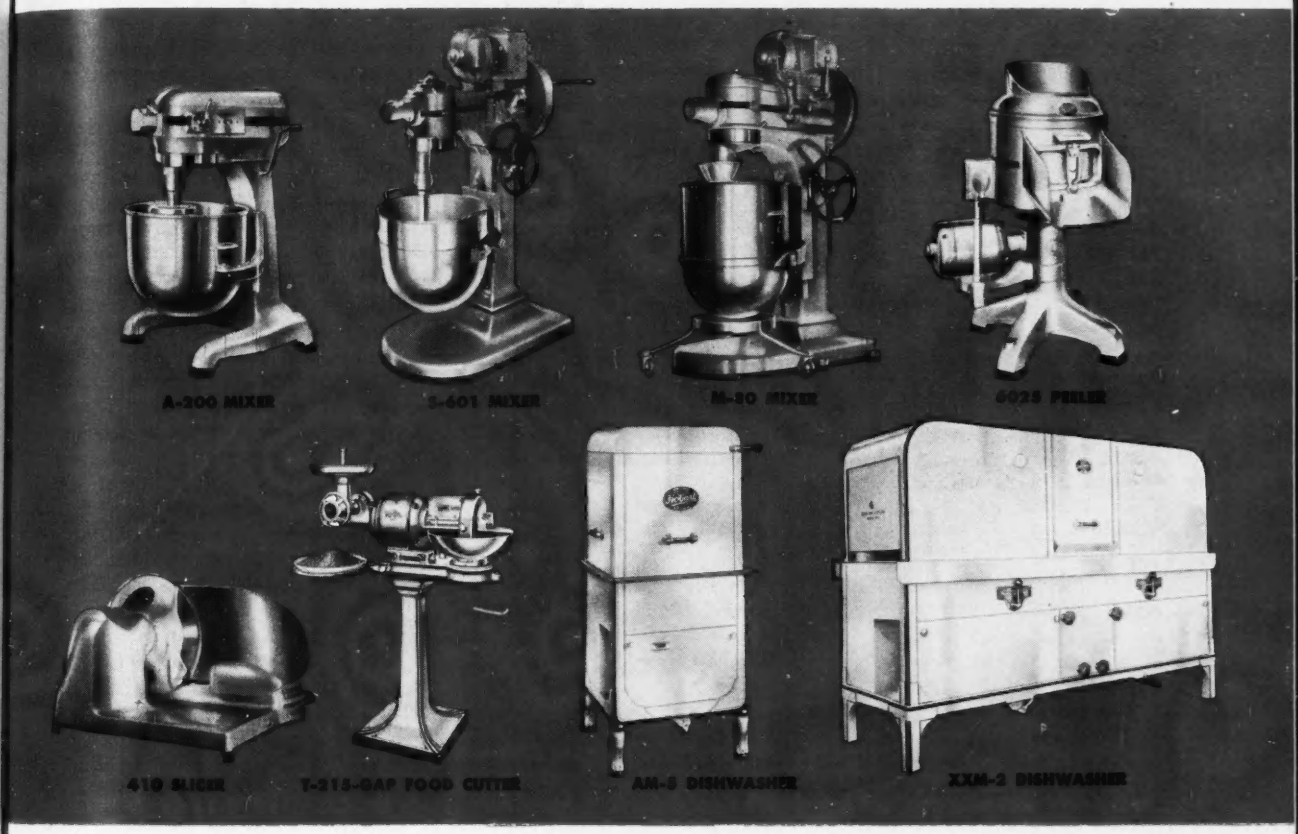
The official ration was definitely low in fat and lime. The total fat intake in Camp A for over 6 months was about 7 gm. daily and even earlier when the full ration of 9 gm. of oil was supplied the rest of the food contained very little fat. The vitamin A and C values were on the minimal side. Peanut butter was the best supplement available in providing more oil, salts and vitamins.

There were no cases of outright malnutrition such as had been seen extensively in Chinese refugee camps, except in the case of a few people who had come up to Shanghai from camps in Hongkong and Manila, who exhibited symptoms of beriberi and pellagra. There was undernutrition as evidenced by loss of weight especially among the heavy work-

*Director of Henry Lester Institute of Medical Research, Shanghai, China.

Hobart Electric Kitchen Machines

Sales and Service offices in all Principal Cities



HOBART MIXERS

In addition to the three mixers illustrated here, Hobart produces a range of models designed for every conceivable operation. They mix, beat, blend, whip, mash. With attachments they chop, grind, slice, shred, grate, crumb, sieve, strain, etc.

All Hobart mixers, regardless of size, feature exclusive Planetary Action—the most thorough, dependable, carefully-engineered mixing action ever developed.

HOBART POTATO PEELERS

New savings in time and food costs! Quiet, speedy and water-tight, these machines peel potatoes and all root vegetables quicker, with negligible peel loss. Sizes to handle any needs.

HOBART SLICING MACHINES

The Hobart Electric Ball Bearing Slicing Machine is ideal for all boneless meats, hot or cold, cooked or uncooked, bread, cheese, vegetables, fruits, etc. Convenient to operate, speedy, quiet, and easy to clean. Maximum safety. Hobart Stay-sharp Stainless Steel Knife.

HOBART FOOD CUTTERS

Featuring distinct advances in speed, thoroughness, safety, ease of cleaning, and economy of space. They cut and mix meats, vegetables, firm fruits, cocoanuts, citron, nuts, boiled eggs, beets—practically anything in the food line, uniformly in a few seconds' time.

HOBART DISHWASHERS

Automatic and semi-automatic models. Made in a complete range of sizes, for kitchens of *any* size. They wash all tableware *clean*, providing highest standards of sanitization in the shortest possible time. They carry such exclusive features as Revolving Wash Arms and the patented Dual-Drive Conveyor.

GUARANTEE AND SERVICE

All Hobart machines are guaranteed and serviced by *one* nation-wide organization. This simplifies the maintenance as well as the purchase of all machines used in your kitchen.

Illustrations show representative models only—there are others in each line to meet the most varied demands. For details and specifications on these or any other models, consult your Hobart representative or write the factory.

ARMY NAVY

Hobart *Food Machines*

The Hobart Manufacturing Company • Troy, Ohio

The World's Largest Manufacturer of Food Machines

Distributed by Hobart agencies in all principal cities—and all leading kitchen outfitters

ers, a number of whom developed hernia. Those people originally overweight were proportionately reduced far more. The general level of good health maintained in both Camps A and B may be attributed to the careful selection of supplementary foods.

Particular care was given to the nutrition of the children. Camp A had about 160 children, whose height and weight were taken periodically; their development compared favorably with the normal. There was a limited supply of milk given to children under 6 years and those in the older groups who were not developing well. All adolescents were given one pint of soybean milk fortified with bonemeal daily, also an extra bread ration. The children's food, for those under 6 years of age, was prepared in a special kitchen by women workers. The cooking had greater variety and the meals were more appetizing than those served in the main kitchens. Camp B had only 16 children, all of whom developed well. Being an invalid's camp there was a fair supply of milk and eggs available most of the time, through the canteen or from the Red Cross.

It should be observed that the majority of the old people in Camp A consumed as much food as the younger people and showed less mental and emotional strain. While the physiological need for food decreases with age, many individuals find it as difficult to change the amount eaten as they do the quality of the diet. In Camp B this observation applied equally well to those in good health.

The old people in poor health in Camp B deteriorated under the rigors of camp life and a large proportion had to be hospitalized in the city. By VJ Day hospitalization exceeded 20 per cent. Ten per cent of the people in Camp B died in camp or in the city hospitals. In Camp A the mortality rate was not high though minor complaints were common; however, apart from malaria, the general health was maintained at a good level. Being in an endemic area there were many cases of malaria. The author resided in a dormitory of 65 to 70 men, a variable number due to billeting changes. Of these about 74 per cent contracted malaria. This dormitory close to a dirty creek was the worst affected. The cases responded well to treatment with quinine and atabrin. Unfortunately supplies of antimalarial drugs were inadequate for prophylactic treatment of the whole camp.

Water in the area of Camp A was unfit for human consumption, so a daily supply was sent out from the French Concession, 12 miles distant. This provided a daily ration of 2 qt. of boiling water. While Camp B had an unlimited supply from the mains of the International Settlement, inadequate boiling facilities limited the ration to a similar amount.

The largest problem of the feeding of internees was that of food acceptability, as related to the foods supplied, the facilities and style of the cooking and the way in which the prepared food was served and eaten. It is not true that hunger will drive people to eat whatever is provided. There was a loss of body weight in most of the adult internees owing to a low calorie intake, not evident in the growing child or in old people. This was due unquestionably to the inacceptability of the food.

The original ration of 240 gm. of rice was far more than any occidental was willing to eat daily. As previously stated, this was almost immediately reduced to 180 gm. and not all of this was consumed. Frequent urination at night was exceedingly common and attributed to the high rice diet. That this was the actual cause is open to question, for people were living under abnormal conditions and may were in a highly nervous state. The rice supplied was of very poor quality, full of husks and dirt which after long treatment only produced a poor product. Due to long storage, the American cracked wheat supplied through the Red Cross in sufficient amount to provide breakfast once or twice a week, was full of weevils. No satisfactory way was found for removing these from the food before serving.

The brown bread provided was an unknown mixture, probably containing whole wheat flour, sorghum, and soybean. It varied from time to time in composition, as the authorities apparently experimented with different materials available on the market. In the summer time this bread exhibited poor keeping qualities, going moldy overnight with a growth over one-quarter of an inch long, and the taste became sour. In the absence of butter or margarine people used their own supplies of peanut butter, jam, honey or lard as a spread; when these were not available people dipped bread in their soup or ate it plain.

The commonest meat provided was beef or carabao meat, from which all of the fat had been removed. Occasionally fat pork was sent in; this sudden increase of fat in the diet resulted in widespread diarrhea. The salt pork provided at New Year had such a foul taste and smell it was universally turned down. Fish, originally supplied about twice a week, was unattractive and there were no facilities for cooking it other than as a stew.

As important as the quality and the quantity of food provided were the facilities and methods of cooking. In Camp A the only equipment provided was one large cauldron for each group of about 250 people. The kettles and pots brought into camp by internees just met the needs of the hospital kitchen where special diets were prepared. The usual menu was boiled rice for breakfast, stew for lunch, soup for supper with more boiled cereal. With an utter lack of experience in the mass feeding of so many people and with such limited facilities the male kitchen staff did the best they could, but at its best the result was a succession of monotonous

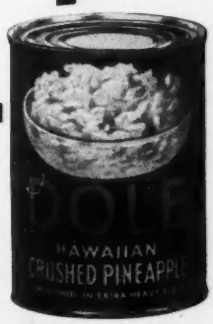
BLISSFULLY COOL

Suppertime in summertime calls for Dole Pineapple Sherbet Sundae as featured here. When you taste this blissfully cool dessert you'll be delighted with the richness of its flavor and its velvety smooth texture. After you personally try this recipe we feel confident that you will see opportunities to use it professionally.

STIR together until sugar is dissolved: ½ cup light corn syrup, ⅓ cup sugar, 2 cups top milk, dash of salt, 1½ cups Dole Crushed Pineapple, 2 teaspoons grated lemon peel, ¼ cup lemon juice.

FREEZE in ice cube trays until firm with temperature control set at coldest setting. Beat in chilled bowl until fluffy; fold in 2 stiffly beaten egg whites; finish freezing. Serve with topping of Dole Crushed Pineapple.

MAKES ABOUT ONE QUART



Dole **HAWAIIAN PINEAPPLE PRODUCTS**

unappetizing meals. In Camp B with its many invalids there was one large cauldron for about each 100 people, which allowed for a greater variety in the cooking and the cooks took more interest in their work. For part of the time enough fuel was provided for each house of about 25 people to run a makeshift stove, so altogether the preparation of food was superior to that in Camp A.

In the serving of the meals there was the inevitable waiting in long queues which was a great trial to the aged and sick. The food was eaten under picnic conditions without the refinements to which practically all of these civilians were accustomed. Apparently the appetite of the individual was severely conditioned by a state of mental and emotional strain and people often felt too tired in mind and body to eat.

The psychological state of the individual was as great a controlling factor of his physical well-being as was the character of the food supplied to his body. Practically everyone was influenced by constant anxiety about finances, destruction of business and personal losses, separation from families, as well as numerous fears and apprehensions and a continuous sense of frustration from confinement. Much was done by the religious and other leaders to offset these factors but there was no lack of evidence of their existence and of the effectiveness of the efforts made in helping to solve some of these major problems in the health of the individual.

Franklin Dove's[5] excellent program upon food acceptance brings to the fore an issue which has been largely neglected in nutrition. Internment camp experiences suggest that more emphasis should be put upon measurement of this factor as conditioned by physical, mental and emotional strain.

Another important aspect of this subject is the relationship of former food habits to the acceptance of new foods offered. So-called camp diarrhea was common among internees, appearing during the first two weeks of internment and intermittently afterwards. The high rice diet to which the European is unaccustomed was held responsible, for withdrawal of this item temporarily from the diet relieved the diarrhea. This is in marked contrast to the report of Shen, in which a ration of 953 gm. of low grade rice was eaten daily by the Chinese soldiers.

The author's observations confirm those made by Adolph, that; (a) the requirements set for sedentary and moderately active individuals at 2,500 and 3,000 calories respectively, are not too high; (b) the individual finds it difficult to accommodate himself to a new diet continued over a long period, monotonous and of low calorie content; (c) the factor of acceptability of a diet merits much greater emphasis, and should be studied under conditions of physical, mental and emotional strain; (d) the highly intricate character of a balanced diet makes it extremely difficult for an adequate diet to be arranged on a minimal caloric basis unless the individual has access to some highly nutritious supplementary foodstuffs such as eggs, milk or peanut butter.

1. Laird, C. N. ..... Nutrition Reviews 1: 97, 1943.
2. Adolph, W. H. ..... Nutrition Reviews 2: 193, 1944.
3. Kramer, M. M. ..... J. Am. Diet. Assoc. 20: 213, 1944.
4. Adolph, W. H., et al. ..... War Medicine 5: 349, 1944
5. Dove, F. ..... Science 103: 187, 1946.

NATIONAL RESTAURANT ASSOCIATION CONVENTION

All phases of restaurant operation, with special emphasis on public relations and personnel, were discussed at the National Restaurant Association's first post-war convention, held in Chicago March 26–28. Speakers described new equipment and new foods, many of which were demonstrated at the accompanying exhibit. With more than 12,000 persons registered, attendance was the second largest in the organization's history.

Continued cooperation on the part of hotels and restaurants in presenting a complete and accurate picture of the food industry to the government and to the public, was urged at the opening session by John L. Hennessy, chairman of the Food Committee of the American Hotel Association. One of the most effective demonstrations of such cooperation, he said, was in convincing the public that public feeding establishments were not receiving more than their share of scarce items.

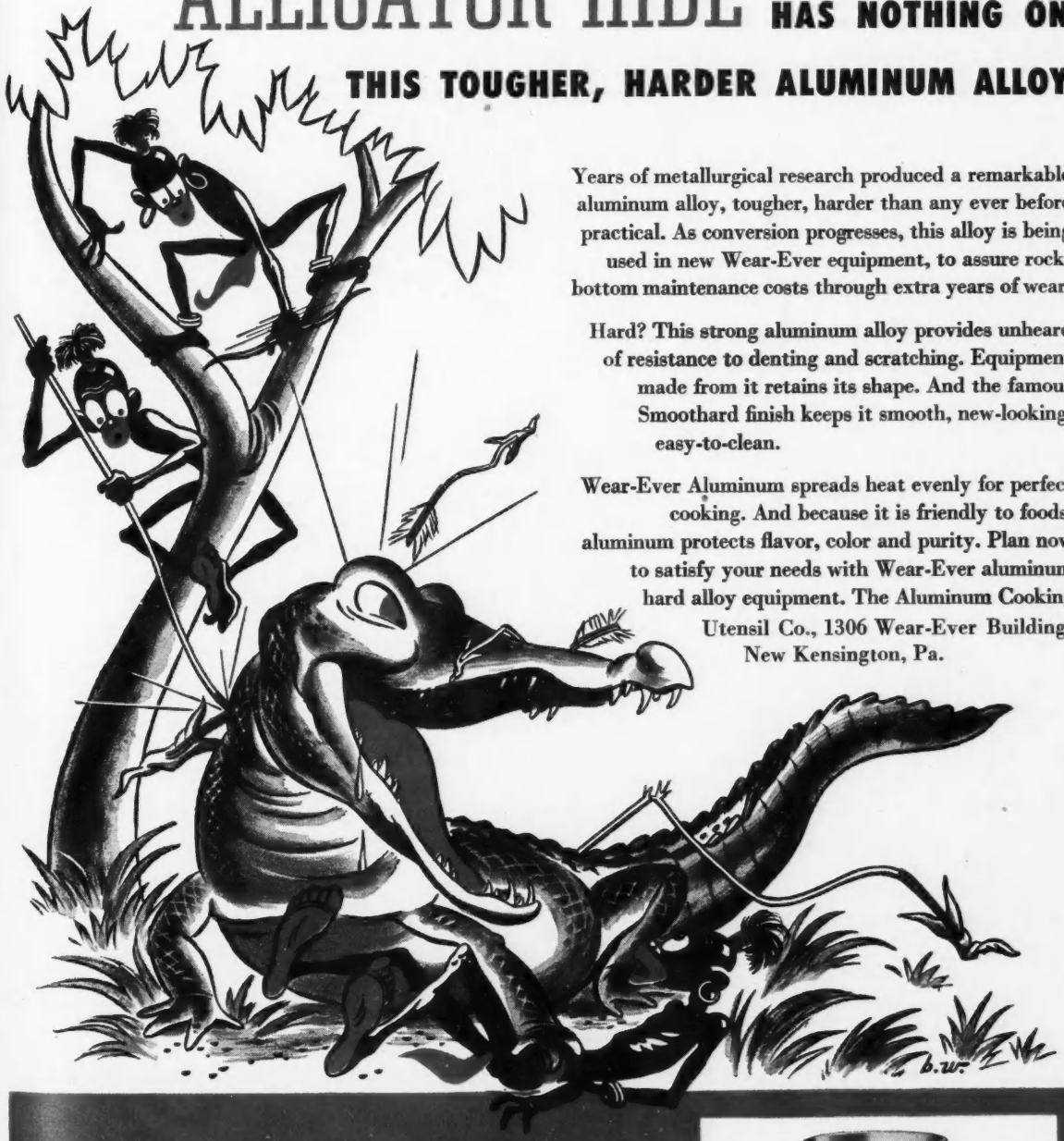
He asked for united effort in the present food crisis to conserve wheat, fats and oils, and predicted that the politics of the world may, in the next few months, hinge on American food supplies.

"The salvation of our system of free enterprise lies in technological improvement, greater productivity, expanded production and consumption, and higher profits based on increased volume," George M. Reynolds, assistant to the Secretary of Commerce, told the gathering. He said that free enterprise must find within itself the leadership to achieve increased production, and emphasized that permanent prosperity depends on the willingness of business to take the initiative and bear certain risks, provided the government takes steps to encourage initiative and cushion the risks. Price controls will need to be maintained for some time to come, he said.

"Every encouragement possible must be given to small business men, who constitute 93 per cent of the business population, sell 30 per cent of all goods and services, and service 90 per cent of the nation," he declared, in describing the plan now before Congress to service small business.

Difficulties with unions will largely be eliminated when industry does a better job in its employee relations, in the opinion of Raleigh W. Stone, associate professor of Industrial Relations, University

ALLIGATOR HIDE HAS NOTHING ON THIS TOUGHER, HARDER ALUMINUM ALLOY



Years of metallurgical research produced a remarkable aluminum alloy, tougher, harder than any ever before practical. As conversion progresses, this alloy is being used in new Wear-Ever equipment, to assure rock-bottom maintenance costs through extra years of wear.

Hard? This strong aluminum alloy provides unheard of resistance to denting and scratching. Equipment made from it retains its shape. And the famous Smoothard finish keeps it smooth, new-looking, easy-to-clean.

Wear-Ever Aluminum spreads heat evenly for perfect cooking. And because it is friendly to foods, aluminum protects flavor, color and purity. Plan now to satisfy your needs with Wear-Ever aluminum hard alloy equipment. The Aluminum Cooking Utensil Co., 1306 Wear-Ever Building, New Kensington, Pa.

NOW . . . MORE WEAR THAN EVER IN

WEAR-EVER ALUMINUM

Made of the metal that cooks best . . . easy to clean

WEAR-EVER ALUMINUM TRADE MARK REG. U.S. PAT. OFF.

Wear-Ever Aluminum STOCK POTS

Wear-Ever equipment has proved its ability to give long years of faithful service. Think how much longer the new Wear-Ever stock pots, made from this still harder alloy, will last.

of Chicago. Speaking on "Industrial Relations Problems", he offered the employer a three-part program. First, maintain employment at a high level over a period of time in order to dispel the deep-seated fear of unemployment. Second, develop a more efficient labor market, by (a) making a thorough analysis of all his jobs, giving consideration to requirements, conditions and circumstances of the job structure, as a basis for a better system of job evaluation and wage administration; (b) making these analyses available to the entire labor area; (c) recruiting workers through the U. S. Employment Service; and (d) cooperating with all employers in exchanging information about jobs, qualifications, number of jobs and rates of pay. Third, give management authority commensurate with its responsibilities, but not unchallenged authority. This latter is a bone of contention with unions at present, he pointed out.

There is no substitute for the human touch in personnel administration, Kenneth McFarland, superintendent of the Topeka, Kan., public schools, told the association.

"People don't fail in business because they don't know their merchandising, or their product, or their service," he declared. "They fail because they don't know people. You can't substitute any other quality for bigness in the man at the top." He showed how emotional reactions condition attitudes of the people working for you, and offered practical suggestions for improving the employee relationship.

In recognition of the importance of sanitation, one session was devoted to a panel discussion of ways to improve dishwashing procedures. Speakers were Nathan Sinai, professor of public health, University of Michigan; Walter F. Snyder, director, National Sanitation Foundation, and W. L. Mallman, director of bacteriology, University of Michigan. Deploring the lack of uniform sanitary codes, Professor Sinai said that presently 4 public health laboratories are working on a standard technic for determining the sanitation of eating and drinking utensils. He believed that education in sanitation needs to be emphasized, and described some of the work to be done.

Using a check list, Mr. Snyder demonstrated a correct way to select, operate, and maintain the dishwashing machine, and told how to organize the help for greatest efficiency.

Dr. Mallman gave facts to prove that a skilled dishwasher, paid good wages, is an economy. He stressed the importance of good working conditions, and showed how to organize dishwashing after a study of procedures, in order to eliminate unnecessary motions. He advised the use of two heats of water, preliminary sorting by the waitress, and careful employee training, so that the effectiveness of the sanitary procedures would not be lost.

Colonel Paul P. Logan, the association's director of food research, warned of the dangers of careless handling of frozen foods.

"Frozen foods, especially precooked dishes containing protein, are dangerous if improperly handled and may become a menace to health and even life," he said. "Harmful bacteria multiply rapidly in such foods unless proper storage conditions are maintained from the instant of production to the time of ultimate consumption." He showed how the increased knowledge of nutrition has spurred food technologists to even greater research of ways and means to preserve the inherent nutrients in different foods, including a study of the best methods of freezing various foods and packaging them.

Commenting on the rapid growth of the frozen food industry, he said:

"A recent survey by an Eastern college indicates that 14 kinds of prepared soup, 33 cooked meat dishes, 14 poultry dishes, 6 sauces and gravies, 21 prepared dishes, 10 fish dishes, 11 dough products and many other pastries are being distributed through retail outlets."

He predicted that restaurants will use frozen foods in much greater volume in the near future, since by doing so they can provide a better stock control, avoid overproduction, and obtain uniformity in quality. Due to the simplicity of storage and the ease of cooking, he believed that the use of dehydrated foods will greatly increase. He told of a new type of dehydrator, just being put into operation, which partly cooks and dehydrates vegetables in a matter of minutes, preserving most of the original nutrients.

Dr. John B. Youmans, member of the American Medical Association's Council on Foods and Nutrition, speaking on the same panel, reminded delegates that the restaurant has a triple responsibility: to teach proper dietary habits; to eradicate poor food habits, and to provide the proper amounts of the various nutrients in the meals served daily.

M. C. Mateer, a Pennsylvania restaurant operator, told how a shortage of help over the weekends caused him to experiment with preparation and quick freezing of foods during the middle part of the week. They then were ready to serve on Saturdays and Sundays, with a depleted staff. Foods prepared in this manner included fruit pies and other bakery products, meats, chicken, beef stew, spaghetti and meat balls.

Electronic cooking was demonstrated by J. C. Sharp of Edison General Electric Company. Electronics is still in the experimental stage as regards cooking, he said, but experiments point to a successful application of the principles in the thawing and re-heating of frozen cooked foods, especially large quantities.

"Among the practical possibilities of electronic cooking are the pasteurizing and sterilizing of large

Important...

to every doctor who prescribes special-purpose foods!

HERE'S how HEMO, Borden's vitamin-and-mineral-fortified food drink with the "milk-chocolate" flavor, stacks up against government minimum daily requirements of vitamins and minerals.

Hemo compared with minimum daily adult requirements*

	Minimum Daily Adult Requirements*	1½ ounces of Hemo and 16 fluid ounces of milk (2 glasses)	1½ ounces (2 servings) of Hemo Powder
Vitamin A	4000 U. S. P. Units	4900	4000
Vitamin B_1	333 U. S. P. Units	400	333
Vitamin B_2	2 Milligrams	3	2
Vitamin D	400 U. S. P. Units	410	400
Niacin amide	* *	10.3 mg.	10 mg.
Iron	10 Milligrams	15.7	14.7
Calcium	750 Milligrams	950	376
Phosphorus	750 Milligrams	750	288

**As set by Federal Security Administrator under authority of the Federal Food, Drug and Cosmetic Act. (Hemo does not contain Vitamin C.)*

***Minimum daily adult requirements not yet fully established.*

Borden's Hemo

IF IT'S BORDEN'S, IT'S GOT TO BE GOOD!

Available in all drug and grocery stores

©Borden Co.

amounts of food," Mr. Sharp declared. "Uniform packages can be passed through a high-frequency field and be heat processed. The possibilities of this process are evident. A chain of restaurants could purchase, process and freeze many items in large quantities. Delivery, carryover and storage problems would be solved."

"Anything can be frozen, even poached eggs and baked Alaska," Percy Brown, chairman of the association's food Committee, commented. He advised care in seasoning, since it has been found that freezing increases the strength of pepper, while salt freezes out. Meats, he said, should be put to cook while still frozen, but poultry, because of the higher moisture content, should be thawed before cooking.

Recognizing the employee's part in good restaurant service, personnel was the theme of one program, highlighted by a dramatization of the right and the wrong way to handle an employee who is giving unsatisfactory service. Burleigh B. Gardner, of the University of Chicago, advised employers to listen to employee's grievances, to have a positive attitude of interest and friendliness, and to praise, rather than criticize. He showed that sympathy will break down barriers and help the employee to change himself, thus reducing labor turnover.

John Beaumont, director of business education for Illinois, demonstrated how to hold a meeting. Among the pointers given were: have a specific purpose; keep the group small and homogeneous; hold the meeting when your people are rested; have your equipment ready; plan your meeting ahead of time; start with the simplest things first, using notes and remembering that you are working with as many different levels of learning as there are people present.

Training programs to build an efficient organization and provide a constant incentive to self-development were urged by Alberta MacFarlane, educational director for the association.

"Training is the most pressing problem confronting restaurants today, and it should be an essential concern to all of us. We want employees who will be efficient and enthusiastic about their jobs, interested in the food they assist in preparing and serving, and proud of the restaurant in which they work and proud to administer its policies.

"We want efficient organization. We want to continue to pay good wages and we want to keep costs at a profitable level. We want all this, but the only way we will get it is to man our restaurants with carefully selected personnel and then do our part through training programs, to furnish the interest and motivation necessary for the efficient organization that we desire.

"We cannot expect to draw on the top strata of the labor market unless we build up our employees, help them to lift their sights from just opportunity to satisfaction and security. Training programs are essential in your operation whether you run a small or a large restaurant. From the moment an employee enters your organization, you should concentrate on molding him into a happy relationship with his job and with his fellowman. If you do this, you will have greater production, you will have decreased absenteeism, and you will have less labor turnover. Common experience shows us that we can pay good wages and have low labor turnover costs if we have efficient organization," Miss MacFarlane concluded.

A standard recipe set-up was described by Beatrice Hughes, general manager of a restaurant chain. Standardization, she showed, achieves uniformity of product and saves food and labor.

Supervision of employees can be partially eliminated and their efficiency increased through the use of a manual setting forth the policy of the organization, and a brief history of the business, together with the names of the officers, directors and department heads, Ralph B. Smith, Toledo restaurant operator said in a discussion of personnel procedures. This manual should include information on hours of operation, time to ring in and out, uniforms, lockers, meals, vacations, insurance, hospitalization and the like.

In the near future glass products, plastics and synthetic textiles will add to the beauty, comfort and efficiency of the restaurant, Ransom M. Callicott told members.

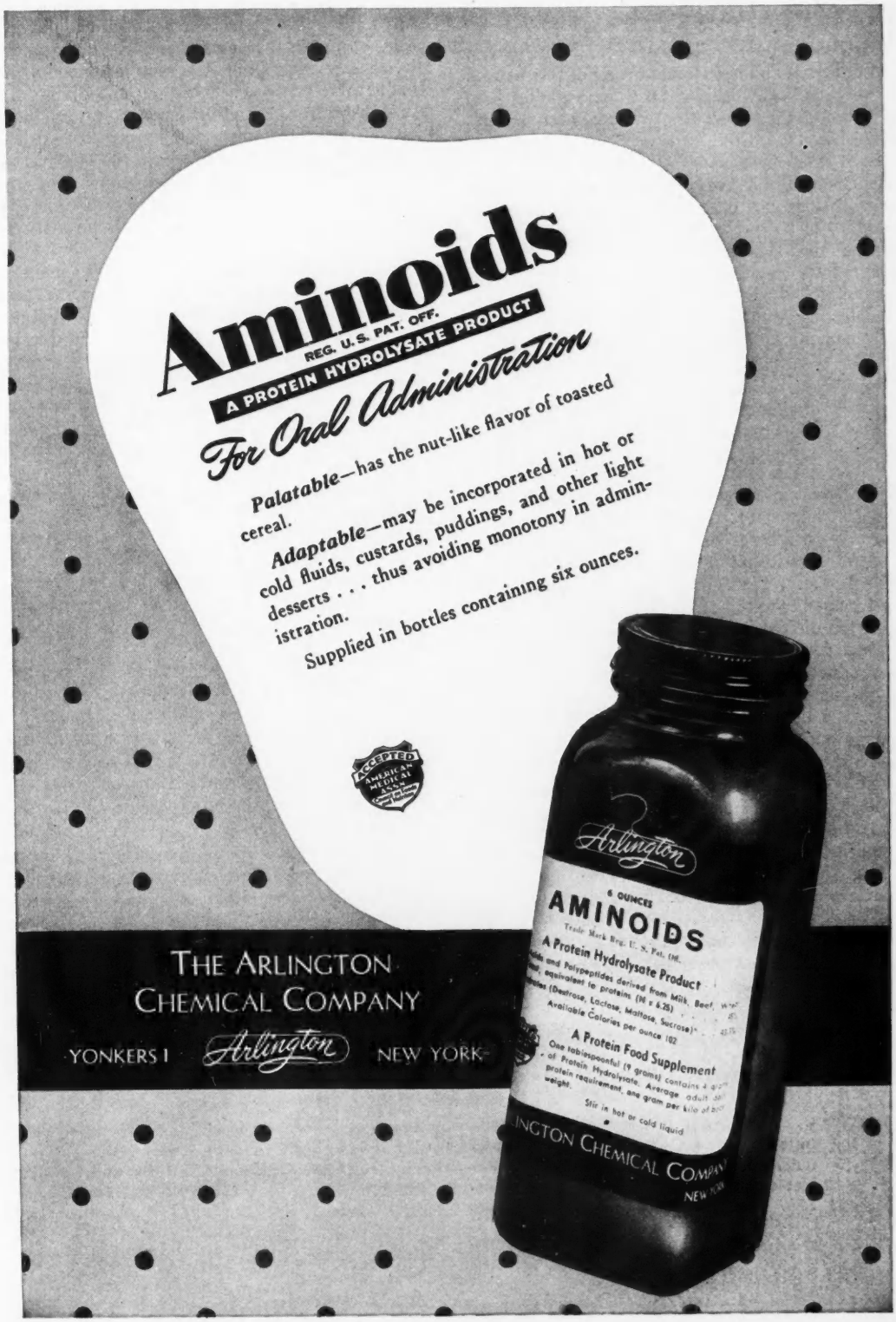
How hotels and restaurants can protect themselves from unwarranted competition was discussed by J. Edward Frawley, president of the American Hotel Association. He recommended that a survey be made to determine the need for a structure before a new hotel be constructed in the community.

Commending the industry for its cooperation in food conservation, John McCarthy, president, American Baker's Association, said, "The present emergency offers the finest opportunity for the food industry to show the world that it has a sense of social responsibility which entitles it to have and to use the great and yet undeveloped powers of a united food industry."

How efficiency engineering, applied to all of the kitchen operations saved time and motions, reduced fatigue and increased efficiency and satisfaction in the work was vividly described by Violet M. Ryley, supervisor of a group of Toronto restaurants.

Consumer rationing will not be resumed, according to Walter F. Straub, director of the emergency food program, USDA, who discussed the problem of voluntary rationing.

Other speakers included Arnold Shircliffe, Chicago restaurateur, who told how a high standard of food can be maintained; Russell Varney of Standard Brands, Inc., who discussed merchandising technics, and Harold G. Moulton of the Brookings Institution, who predicted a prosperous future for restaurants and business generally.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A PROTEIN HYDROLYSATE PRODUCT
For Oral Administration
Palatable—has the nut-like flavor of toasted cereal.
Adaptable—may be incorporated in hot or cold fluids, custards, puddings, and other light desserts . . . thus avoiding monotony in administration.
Supplied in bottles containing six ounces.
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RECENT IMPROVEMENTS IN FROZEN FOODS

Frozen foods may well become major factors in the agricultural and nutritional future of this nation, and may radically change the pattern of food preparation. This prediction was made at the first annual meeting of the Frozen Food Foundation, Inc., Syracuse, N. Y.

Expansion of the frozen food industry has been rapid and there has been a steady improvement in the quality of the products, Dr. Donald K. Tressler, consultant on foods for the Foundation, said in an address at the meeting. Excerpts from Dr. Tressler's talk follow:

"Laboratory studies which have indicated how to control enzyme actions and oxidation, have shown how to freeze a large variety of vegetables and fruits. Improvements in the quality of many frozen fruits have been brought about by the use of sugar and syrups, by treatment with ascorbic acid and other agents which inhibit browning, and by the addition of small amounts of ethyl caffeate.

"Studies of enzyme inactivation by treatment with either steam or water near the boiling point have shown how nearly all of the common vegetables can be frozen without marked change in flavor or notable loss of nutritive values. Freezing of precooked foods is the most recent development.

"Greater difficulties are encountered in freezing precooked foods than are to be found in freezing other products. Freezing often causes the breaking of emulsions and the coagulation of many collodial solutions. During storage fats and oils may oxidize, hydrolyze and become rancid. Colors often fade. Some vitamins may be oxidized and otherwise changed.

"Chemical and technological research have done wonders in solving many of these problems. The accomplishments of a single year often seem insignificant, but looking back over the past 20 years we can see the enormous strides that have been made.

"Owing to the fact that there are so many companies which have not previously frozen foods now entering the business of freezing both raw and cooked foods, there is a great need both for wide dissemination of accurate, detailed information concerning freezing processes and the establishment of quality standards for frozen foods of all kinds. As the precooked frozen food business grows, products will be subjected to longer and longer storage periods. It is important that research on the freezing of precooked foods be pushed rapidly now, and further, that information concerning the best methods of preparing and freezing these foods be made available to all.

"If the quality of frozen foods is to be maintained, the packer, the warehouseman, the broker, and the retailer all will have to work together. Selection of high grade raw material is not simply a question of paying top prices for produce to be frozen or to be used in making products to be frozen. Variety, maturity, freshness, as well as the soil, weather and climatic conditions under which the vegetables are grown all have important effects on the quality of the frozen products.

"Although quality of the raw material is a factor of prime importance, there are others of almost equal importance. Sorting, grading, washing, blanching, cooling, draining, packaging and freezing procedures all are important. If proper procedures are not employed in the freezing plant, excellent raw material can be damaged and perhaps ruined.

"Uniformly low temperatures during storage, transportation, and display also are of great importance in maintaining quality of all foods. Poultry, fatty fish, corn-on-the-cob, asparagus, peaches, apricots, and many precooked foods require temperatures lower than zero if they are to be held for longer than 6 months."

Organized early in 1945, the Foundation is conducting research for the purpose of establishing standards of quality; of improving foods and plant equipment; of determining nutritive aspects of foods and applying these findings to merchandising; and of studying the physical and chemical phenomena pertaining to freezing of prepared foods.

The Brazil Nut as a Source of Methionine

THE BRAZIL NUT contains more methionine than any other food according to recent tests made by USDA scientists. This discovery was made during research to determine the nutritive values of various foods and was reported by the Bureau of Human Nutrition and Home Economics Agricultural Research Administration.—*Food Field Reporter, March 18, 1946*

a natural for a perfect breakfast!

This cereal that's golden-good nutritious whole wheat

Patients love Nabisco Shredded Wheat – with all the glorious, natural flavor of whole wheat! Just as much nourishment as cooked cereal . . . it's really a rousing good bowlful of breakfast. The one cereal that tastes good served cold or hot! So be sure you serve Nabisco Shredded Wheat – the original Niagara Falls product – just the pure whole wheat . . . steamed . . . shredded . . . baked!

Delicious, ready to serve...
yet as nourishing as a hot cereal

Appointments, Army Medical Department Dietitians

The following Medical Department Dietitians were appointed during the month of April 1946

Madison, Bernadine H.: Iowa State Col.; Fitzsimons G. H., Denver, Colo
Nathan, Natalie R.: Carnegie Institute of Tech.; Fitzsimons G. H.
Saunders, Eleanor M.: Boston Univ.; Fitzsimons G. H.
Sullivan, Joan C.: Syracuse Univ., N. Y.; Fitzsimons G. H.

Promotions, Army Medical Department Dietitians

The following Medical Department Dietitians have been promoted during the month of April 1946. They are on duty in Army hospitals in this country and overseas.

First Lieutenant to Captain

Hammond, Doris C., R-379
Miller, Elsie G., R-452
Rambler, Gladys S., R-463
Richards, Rita R., R-174

Second Lieutenant to First Lieutenant

Batzis, Katherine, R-2063
Bernholtz, Bonnie N., R-2175
Carr, Helen M., R8-381
Dickinson, Elizabeth H., R-1347
Gantt, Grace, R-2085
Harter, Corinne M., R-2098
Lewis, Emily V., R-2076
Macri, Rosa C., R-2023
Newell, Barbara M., R-2022
Reynolds, Daphne, R-2073

Army Medical Department Dietitians Separated From the Service[1]

The following dietitians have been separated under the provisions of the separation policy established by the Surgeon General for Medical Department Dietitians.

Captains

Conway, Mary R., R-124, 555 E. Market St., Elmira, N. Y.
Lamberson, Lois, R-521, S. Giddings Ave., Visalia, Calif.

First Lieutenants

Adrian, Florence L., R-201, 40 W. Patterson Ave., Columbus, Ohio
Atkinson, Dorothy, R-480, Box 21, Newton, Ala.
Bemis, Lois M., R-1108, Summer St., Northboro, Mass.
Blaylock, Margaret M., R-1336, RR #2, Mankato, Kan.
Bone, Roberta K., R-1242, 327 W. Prairie, Apt. 3, Decatur, 27, Ill.
Boyd, Zola C., R-823, 1046 "A" St., Springfield, Ore.
Brill, Gretchen H., R-1435, Richland, Ia.
Campbell, Gale, R-83, Idabel, Okla.
Carlin, Virginia R., R-813, Buechel, Kan.
Carter, Anne E., R-245, 716-37th Ave., St. Petersburg, Fla.
Charles, Virginia R., R-1124, 306 E. Harrison St., Maumee, Ohio
Cosner, Lillian B., R-1018, 3901 N. Delaware, Indianapolis, Ind.
Curran, Catherine B., R-581, 723 W. Main St., Decatur, Ill.
Currie, Esther E., R-1321, 303 Auburndale Ave., Auburndale, Mass.
Denison, Jacqueline L., R-549, North Shore Dr., Benton Harbor, Mich.
Dershimer, Evelyn, R-449, 85 Maple Ave., Tunkhannock, Pa.
Duffy, Winifred C., R-1219, 72 Dover St., Newark, N. J.
Ensign, Donna M., R-993, 313 S. Shelby St., Cadillac, Mich.
Ewing, Nancy J., R-1340, % Rancho, Santa Fe, Calif.
Gantt, Grace, R-2085, 114 Moreau Dr., Jefferson City, Mo.
Goldstein, Beatrice F., R-990, 754 S. 10th St., Newark, N. J.
Goldstone, Edith, R-1349, 1617 Thomas Pl., N. Minneapolis, Minn.
Goold, Rachel F., R-2109, Fairbury, Ill.
Gorman, Margaret C., R-755, 2089 Carter Ave., St. Paul, 8, Minn.
Groner, Dorothy M., R-2044, 280 Riverside Dr., New York City, N. Y.
Gruel, Joyce E., R-1082, Box 2029, Great Falls, Mont.
Hanley, Betty A., R-1359, 114-Seventh Ave., S. Lewiston, Mont.
Harger, Virginia F., R-2008, 1517 S. Maple St., Spokane, Wash.
Harrison, Louisa B., R-923, 96 College St., Fredericktown, Ohio
Hendricks, Gwendolyn L., R-2067, Chelan Falls, Wash.
Hilfman, Ruth I., R-545, 426 S. Clinton St., Iowa City, Ia.
Jepson, Isla L., R-39, 105 E. Spring St., New London, Wis.
Ketcham, Betty M. R-574, Dowling, Mich.
Kress, Ethel M., R-378, 1298 Belmont St., Dubuque, Ia.
Kutnick, Marion, R-1205, 1069 Thornhill Dr., Brooklyn, N. Y.
Levie, Sylvia J., R-1127, 1926 N. Market St., Canton, Ohio
Louhi, Aura D., R-1148, Box 95, Ashby, Mass.
Luke, Elizabeth, R-498, 1017 Grand Ave., Ashburn, Ga.
Marsh, Elizabeth C., R-1255, 1410 Dorse Overbrook Hills, Philadelphia, Pa.
Mason, Angela P., R-1075, 2308 Hamilton Ave., Baltimore, Md
Mathes, Margaret S., R-916, Durham, New Hampshire
McConville, Virginia H., R-824, 1855 Juliet Ave., St. Paul, Minn.
Moe, Margaret B., R-2177, 2525 E. Franklin Ave., Minneapolis, Minn.
McKray, Rosalind, Irene M., R-992, % Mrs. Ralph Rothbart, Box 28, Keyport, N. J.
Morris, May, R-816, 1934-9th St., Des Moines, Ia.
Newcomb, Margaret O., R-1319, Spring St., Burton, Ohio
O'Dell, Ethel C., R-1328, 314½ Wasaon St., Toledo, Ohio
Pearson, Beatrice, R-210, 224 West 15th St., Mission, Tex.
Pearson, Elinor, R-531, 1219-6th St., Perry, Ia.
Rose, Marjorie E., R-1250, 4422 Marquette Dr., Ft. Wayne, Ind.
Rousseau, Marylou, R-1261, 29 Jeppson Ave., Worcester, Mass.
Sellers, Merle M., R-776, Rising Star, Tex.
Shade, Genevieve F., R-1023, 406 Delaware St., Urbana, Ill.
Steele, Elizabeth J., R-1174, 135 Cadima Ave., Coral Gables, Fla.
Stelter, Jane L., R-71, Charlevoix, Mich.
Theis, Ethel J., R-627, 1012 Tenth Street, N.W., Washington, D. C.
Upjohn, Elizabeth G., R-2013, Rib Lake, Wis.
Ward, Nannie B., R-474, Decatur, Tenn.
Williamson, Martha E., R-1168, Darlington, S. C.
Zambrano, Louise C., R-1088, 1408 Moringside Ave., Pittsburgh, Pa.
Zeitel, Phoebe H., R-745, 2714 University Ave., New York, N. Y.

Second Lieutenants

Conger, Agnes E., R-2028, 1710 Olive St., Cedar Falls, Ia.
Ericksen, Grace K., R-2182, Baldwin, Wis.
Fay, Margaret A., R-2305, 5436 Bartlett St., Pittsburgh, Pa.
Jones, Katherine A., R-2404, Sterling, Kan.
Lamb, Gertrude E., R-988, 450 S. Humboldt Street, Denver, Colo.
Learned, Norma G., R-2338, 988 S. William St., Denver, Colo.
Maynard, Nancy M., R-2454, 201 Cayuga Hts. Rd., Ithaca, N. Y.
Rosenberg, Lillian, R-1291, 18 Wyckoff Ave., Brooklyn, N. Y.
Sadacca, Roslyn, R-1362, 112 Central Park South, New York City, N. Y.
Stambler, Marion M., R-2363, 50 Braemore Gardens, Toronto, Ont., Can.

[1] First Lts. Charlotte R. Scripture, R-1079 and Betty R. Richards, R-1134, were not separated as previously reported in the JOURNAL.

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Book Reviews

Food and Agriculture Organization of the United Nations— Report of the First Session of the Conference. Washington, January 1946.

The first of the new, permanent, United Nations agencies has been launched. It is something new in international history.

The intentions of the United Nations Interim Commission on Food and Agriculture have been carried out with sincerity, thoroughness, and high quality as evidenced by the recommendations made in the report from the First Session of the Conference of the Food and Agriculture Organization of the United Nations.

It will be remembered that on the invitation of the United Nations Interim Commission on Food and Agriculture and through the hospitality extended by the Government of Canada, representatives of the United Nations met in Quebec on October 16, 1945, to sign the Constitution of the Food and Agriculture Organization of the United Nations and to hold the first session of its Conference.

With the formal establishment of the Food and Agriculture Organization, the United Nations Interim Commission on Food and Agriculture ceased to exist. Sir John Boyd Orr was appointed as director-general of the Food and Agriculture Organization. The Conference also appointed an executive committee, five members being elected for 3 years, 5 for 2 years, and 5 for 1 year. Howard R. Tolley, chief, bureau of agricultural economics, Department of Agriculture, Washington, was appointed to the executive committee for a 3-year period. He was also appointed vice-chairman.

The work of the Conference was reported in two parts. Commission A dealt with the broad subject of FAO policies and programs and what the organization might do to realize its objectives. Commission B dealt with organization and administration, and the necessary machinery through which the policies and programs can be carried out. According to L. B. Pearson, chairman of the first session of the Conference, there was an impressive unanimity of opinion among the delegates assembled at Quebec both on the structure of FAO and on a program of work.

Commission A allocated its work among six committees, including nutrition and food management, agriculture, forestry and forest products, fisheries, marketing, and statistics.

Members of the nutrition and food management committee were: André Mayer, chairman; W. R. Aykroyd, reporter; F. G. Boudreau, secretary; and Faith Clark, and Faith Williams, assistant secretaries. In the report of the committee on nutrition and food management the primary objective was stated to be to raise levels of nutrition throughout the world, and to ensure not only that all peoples are freed from the danger of starvation and famine but that they obtain the kind of diet essential for health. Recommendations were presented in three parts: (1) A Practical Program for Immediate Action; (2) Problems for Study in Collaboration with Experts in Member Countries; and (3) Other Lines of Work.

In the first part, "A Practical Program for Immediate Action," recommendations were made for a rapid survey of available food resources and needs of necessitous countries to allay the immediate hunger and malnutrition. It was stressed that improvement of the diet of the vulnerable groups (special emphasis is laid here on pregnant and nursing women, infants, and preschool and school children) should be an immediate preoccupation of FAO. Studies should be made of measures followed in different countries and reports made available to member nations for their information. An investigation of school-feeding methods was recommended with special reference to cost and organization.

It was pointed out that national nutrition organizations can contribute to the work of FAO. One of the first tasks should be to encourage the formation or resuscitation of national nutrition organizations or equivalent agencies. Whatever their precise form, their objectives should include the formulation of food policies for the consideration of governments, the coordination of research, and the development of operational and educational programs for the improvement of nutrition.

Training in nutrition was recommended since there are an insufficient number of nutrition workers, including research workers, public-health-nutrition workers, dietitians, and home economists. Organizations for the training of personnel for work in Eastern countries and tropical countries are much needed. It was recommended that as a preliminary step, a directory of existing institutions and facilities for training of various kinds should be prepared and made available to member nations. Collaboration with health organizations and other international organizations for mutual assistance and the benefit of member nations was recommended. It was also pointed out that FAO should undertake the collection, on a world-wide scale, of data on food consumption and dietary habits, the state of nutrition of populations and the prevalence of malnutrition and deficiency diseases, along with information on the measures taken to improve nutrition in various parts of the world. To maintain adequate information services it was recommended that FAO must collect the books and documents necessary for a comprehensive library.

In the second part, emphasis was given to Problems for Study in Collaboration With Experts in Member Countries. While FAO will need the help of experts in member countries in the development of all aspects of its program, the study of certain questions particularly requires the collaboration of appropriate expert groups. The following problems are enumerated for study: dietary standards; dietary surveys and their technic; the composition of foods; the classification of foods to facilitate comparison of consumption data and nutrition and economic analyses; the various aspects of popular education; and food conservation and technology.

In the third part entitled "Other Lines of Work", further problems for study were outlined: the effect on food consumption of social and economic policies and measures, including among the latter minimum-wage and social se-

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curity legislation, family allowances, taxation of various kinds, food subsidies and special feeding programs; the social and psychological background of dietary habits; the discovery and development of food plant strains and varieties which are of exceptionally high nutritive value and the use of production methods which enable full advantage to be taken of their nutritive qualities; and assistance to nutrition workers in the identification of plants and animals which are sources of food.

The problems of food were further correlated and incorporated in the reports of planning of other committees on agriculture, forestry and forest products, fisheries marketing and statistics.

All recommendations were made to the director-general. There can be no doubt that the director-general can hope to implement only parts of this program—such parts as his resources and other circumstances permit.

Nutrition and Chemical Growth in Childhood. Vol. II. Original data, Icie G. Macy. Springfield, Ill.: Charles C. Thomas, 1946, Cloth. Pp. 1460. Price $10.

This is the second volume of the comprehensive and coordinated investigation of the nutrition and chemical growth of children; the page numbers are a continuation of those in the first book. A third volume on application is to follow.

This series of volumes represent a tremendous undertaking of securing accurate information for normal children under conditions comparable to that of a healthy home environment. The accumulated data of 10 years research on 21 boys and girls of 4 to 12 years of age are presented.

Volume II deals with the original data which are given in their entirety in turn for each child. Height-weight records, skeletal maturation, anthropometric measurements, blood determinations, basal metabolism, balance studies for nitrogen, carbohydrate and all minerals, emotional reaction scores, dental data, roentgenograms of the gastro-intestinal tract, determined at intervals throughout the 10-year period are presented for each child.

Among excellent features of the book are the actual size reproductions of the roentgenogram of hand, elbow, hip, shoulder, knee and foot made at regular intervals throughout the growth period.

A section is included giving the original and detailed data on the mineral metabolism of 5 healthy preschool girls and 7 boys collected under the direction of Julia Outhouse Holmes at the University of Illinois.

The book is well produced, reproductions are excellent, and the mass of data are well tabulated.

The book will be an invaluable reference not only for the nutritionist but for all who work with children and are concerned with their physical and chemical growth and development. Nothing comparable in extent and completeness of information has been produced. It fills a gap in our knowledge.—*E. Neige Todhunter, Laboratory of Human Nutrition, School of Home Economics, University of Alabama.*

A Laboratory Manual in Dietetics. Revised Edition. By Laura McLaughlin, Minneapolis, Minnesota; Burgess Publishing Company. 1946. Paper. p. 99. Price $1.50.

This manual is designed to give directions for exercises to accompany and illustrate lectures and discussions in normal nutrition. The exercises are comprehensive and thorough, and include such problems as a computation of the energy balance by recording food intake and estimating the energy expenditure, the calculation of the nutritive value of diets, the computation of the cost of foods per serving and also the relative cost of foods as a source of the several food nutrients in a diet. The assessment of nutritional status of the adult and the problem of food budgeting are included. The forms on which the problems are computed are on perforated sheets, such that they can be readily removed from the manual. The student who completes these exercises should have a thorough-going knowledge of foods, their nutritive value and cost.

A Laboratory Manual in Advanced Dietetics Including Diet in Disease. By Laura McLaughlin, Minneapolis, Minn.: Burgess Publishing Company. 1946 Paper, pp. 131. Price $1.75.

This manual has been prepared to facilitate the laboratory assignments included in diet therapy courses. The student is asked to make a dietary case study of herself, and to plan adequate diets for herself or someone whom she might choose, at 3 levels of cost. Diets for invalids and for infants and children of various ages are planned and exhibits of a day's food prepared. Representative diets for persons with disease conditions are set up as weighed diets. Although quantitative diets would not be the common practice in the hospital it is true as Doctor McLaughlin indicated in the preface that, "after having set up, calculated, and discussed a dozen measured or weighed diets a student has some confidence in her ability to estimate nutritive values and to change menus quickly." There is a possibility for Doctor McLaughlin's students to gain some first-hand experience in the dietary department of their college hospital which is invaluable in making dietetics real to students. Work and report sheets for this experience are included in the manual. The assignments in the manual would give the student excellent training, particularly when used in close conjunction with hospital experience.—*Eva Donelson, Chairman, Foods and Nutrition Division, Ohio State University.*

Small Business as a Career. By O. Richard Wessels. Syracuse, New York; Syracuse University Press, 1946. Cloth. Pp. 200. Price $2.50.

The author has clearly and briefly described the fundamentals for all successful small businesses regardless of kind, viz.: procedures and considerations necessary for the selection of location; financial management; legal considerations and risks; sales practice and controls. Included is a check list for self-examination of qualifications necessary for starting a small business. The chapter "Keeping Records for Your Business" is particularly outstanding in completeness and versatility in application to specific situations.

The Best from Midwest Kitchens. By Ada B. Lothe, Breta L. Griem, Ethel M. Keating. New York: M. S. Mill Co. Inc., 1946. Cloth. Pp. 284. Price $2.50.

This book of some 700 recipes, applicable suggestions for menus, and table settings is of particular interest to members of the American Dietetic Association. The 3 authors have first-hand sources for this unusual cookbook. They are all professional dietitians and all native Midwesterners. Their interest over many years in the adaptation of pioneer Midwest cookery to the kitchen of today led to the compilation of this book. In the course of their research, they had been struck by the purely American cookery which has evolved out of the contributions of the different races which settled the Midwest.

Recipes are varied; the instructions are complete including the specific amounts; sound methods for procedure, cookery timing, and oven temperatures are given. These particular features eliminate the guess work and guarantee the finished product, thus making this book highly commendable for the bride.

This publication is removed from the category of *just a cook book*, with its opening chapter and cleverly written historic background which introduces each group of recipes.—*Adeline Wood, Food Consultant.*

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Current Literature

Contributed by Janet Engebretsen and Janette C. Carlsen, Dietary Department, Johns Hopkins Hospital; Quindara Oliver Dodge, Women's Educational and Industrial Union, Boston; and the Journal staff.

AMERICAN JOURNAL OF DIGESTIVE DISEASES

Vol. 13, March 1946

* Protein deficiency in man. M. Sahyun.—p. 59.
* Vitamins and hormones in nutrition II. Endocrine dyscrasia. B. F. Sieve.—p. 80.

Protein Deficiency. Negative nitrogen balance and other physiological disorders, attributed to protein deficiency, such as hypoproteinemia, infections, edema and anemia are reviewed and summarized, along with protein deficiency in pregnancy and lactation, and nitrogen secretion in burns and surgery.

Vitamins and Hormones. The author reports on 6 cases which he believes demonstrate the effect of endocrine dyscrasia on vitamin absorption, and the resultant interference in the synergistic action of vitamins and hormones.

AMERICAN JOURNAL OF DISEASES OF CHILDREN

Vol. 71, January 1946

* Sucking response of newly born babies at breast. M. A. Norval.—p. 41.

Vol. 71, February 1946

* Behavior problems in children. H. Bakwin.—p. 113.
* Outlines for well baby clinics: I. Recording development of the first twelve months. C. A. Aldrich and E. X. Hewitt.—p. 131.

Sucking Response. Observations were made on the sucking response of 50 newly born babies at the breast. It was concluded that the average early response of newly born babies to the breast is not a greedy one but is characterized by dallying and repetitious trials at nursing. This behavior should be met with patience and with calm attempts to allow the baby to learn the gratification he can get from nursing rather than with vigorous unpleasant stimulation. Under conditions in which supplementary milk formulas are not given until the mother's supply of milk has been proved inadequate and in which the mothers are given adequate instructions on how to cooperate with their babies, 96 per cent of the infants suck well at the breast.

Behavior Problems. The principal mechanisms underlying the behavior disorders of the child are outlined. Certain common behavior disorders in the child are discussed, including anorexia, with suggestions for the management of these problems.

Well Baby Clinics. A complete picture of the infant is seldom obtained even in established clinics. Since well baby clinics developed from mere "feeding stations," one of the primary functions still is prescribing formulas and diet. The Rochester Child Health Project has evolved a set of cards for each month of the first year of life. The important factors to be considered and expected development are noted on each card with explanations. This article will interest pediatric dietitians since the development of a child in the first year depends in large part on food and changes of food.

THE AMERICAN JOURNAL OF THE MEDICAL SCIENCES

Vol. 211, March 1946

* Penicillin therapy in ulcerative colitis. B. B. Korostoff and H. E. King.—p. 293.

Ulcerative Colitis. Five cases of ulcerative colitis have been successfully treated with penicillin. Although too few to draw any conclusions, this is an indication of helpful therapy. Longer periods of observations on more patients are needed. During therapy, patients were placed on high protein, high CHO, low residue diets. Within one week after the penicillin therapy, rectal ulcerations had disappeared and the patients' general condition was improved.

AMERICAN JOURNAL OF OBSTETRICS AND GYNECOLOGY

Vol. 51, March 1946

* The fetal mortality in women during the prediabetic period. J. Herzstein and H. Dolger.—p. 420.

Fetal Mortality During Prediabetic Period. Careful obstetric histories were taken on 200 diabetic women attending the Metabolic Clinic at the Mt. Sinai Hospital (N. Y.). These histories were analyzed to determine the fetal and neonatal mortality rates occurring among the offspring of these women during their prediabetic years. It was found that the 200 women had given birth to 626 children during this prediabetic period. The total infant fatality rate for a 20-year prediabetic period was 6.1 per cent. The corresponding rate for nondiabetic women as given by others ranged from 2 to 6 per cent. This is interpreted by the authors as not differing significantly from normal. However, the fetal fatality rate for the first 5 years preceding the onset of recognized diabetes was 15.4 per cent.

THE AMERICAN JOURNAL OF PHYSIOLOGY

Vol. 145, March 1946

* Effect of protein deficiency and cholesterol feeding on the liver of dogs. T. W. Li and S. Freeman.—p. 646.
* The importance of exogenous fat in fatty infiltration of the liver of dogs. T. W. Li and S. Freeman.—p. 667.

Effect of Protein Deficiency and Cholesterol Feeding on the Liver of Dogs. Fatty livers were produced in dogs maintained on a 33 per cent fat-protein deficient diet for 10 to 16 weeks. Added cholesterol caused a uniformly higher total lipid and cholesterol content of the liver of the protein deficient dog. Protein depletion impaired hepatic dye clearance and caused elevation of the serum phosphatase in dogs. The addition of cholesterol resulted in an abrupt drop in dye clearance at the beginning of the experiment, and a uniformly higher elevation of serum phosphatase than that caused by simple protein deficiency. All dogs with

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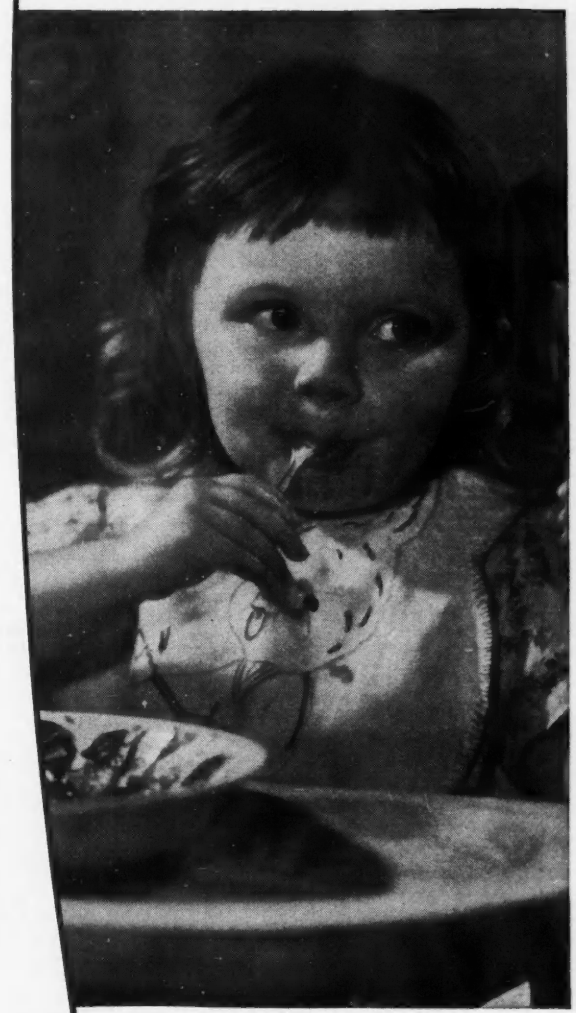

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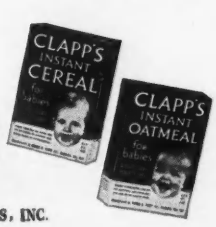

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increased liver lipids or cholesterol had a reduced dye clearance. The lipotropic action of protein in dogs was clearly demonstrated by the absence of fatty infiltration of the liver in the animals with an intake of 2.0 gm. of casein per lb. daily. Two gm. of casein per lb. body weight daily can prevent fatty infiltration of the liver in dogs on a high fat diet for 16 weeks, but this protein intake is not sufficient to prevent "cholesterol" fatty livers.

Bile Salts and the Fatty Infiltration of the Liver in Dogs. The effect of bile salts and the effect of dietary fat level on fatty infiltration of the liver in dogs on a high fat protein-deficient diet were studied. It was found that bile salts increased absorption of fat and cholesterol in dogs as evidenced by the elevation of total lipids and cholesterol in the liver. Livers were uniformly higher in fat on the high-fat protein-deficient diet, with or without cholesterol, when bile salts were given. The fat content of the liver increased as the fat content of the protein deficient diet was increased. Exogenous fat impaired liver function in the protein deficient dog.

THE AMERICAN JOURNAL OF SURGERY

Vol. 71, March 1946

* Subtotal gastrectomy in treatment of ulcer. M. K. King.—p. 350.

Diet in Sub-Total Gastrectomy. Seventy-five selected cases of intractable ulcer treated by sub-total resection are reported. Complete recovery occurred in all. After surgery gastric suction was started and tap water was given freely. Intravenous fluids were administered for 48 hours. Clear liquids were started at the end of 48 hours with gastric tube clamped off. If tolerated well, milk, custards, eggnog and cereals were rapidly added and on the fifth day a fairly substantial diet was given. Most of the patients eventually found they could eat a meal of moderate size. Many of them ate large meals and very few followed the recommended several small meals daily.

ANNALS OF INTERNAL MEDICINE

Vol. 24, March 1946

* The response of cirrhosis of the liver to an intensive combined therapy. L. M. Morrison.—p. 465.
* Hepatitis. An editorial.—p. 511.

Therapy in Liver Conditions. Revolutionary schedules for cirrhosis patients have given them hope for existence which they've never had until this decade. Patek's regime plus other therapeutic measures have been confirmed in this study of 62 patients. Diet held an important place; patients were placed on high protein, high carbohydrate, minimal fat diets. Some of the group were given added vitamins (B complex), liver extract, choline, methionine, casein, and cystine. From 28–45 per cent of the 62 patients had a history of alcoholism and poor dietary histories which indicated a low intake of meat and dairy products. Various therapeutic measures were combined with great success; intensive therapy reduced mortality and disability markedly.

Hepatitis. Hepatitis has caused a major medical problem for the Armed Forces (both U. S. and others); moreover certain civilian areas have had wide-spread outbreaks. Two types have been defined: infectious hepatitis and a hepatitis following administration of human blood or blood products. Most cases have shown complete recovery within three months with few recurrences. The incidence of cirrhosis seems to have been rare. As yet the active agent is not determined but it is known to be present in blood and may be transmitted by injections of blood, or by feeding blood or feces to animals; infected material sprayed into the nasopharynx also will cause hepatitis. In the war there was strong epidemiological evidence that the disease was transmitted by ingestion of food or water that had been contaminated by infected feces. Blood "pools" have been contaminated by one carrier donor.

ARCHIVES OF INTERNAL MEDICINE

Vol. 77, February 1946

* Blood—a review of the recent literature (concluded). F. H. Bethell, C. C. Sturgis, R. W. Rundles and M. C. Meyers.—p. 196.

Blood. The final article in the review of blood includes a discussion of hemorrhagic disorders and coagulation; effect of vitamins on clotting time; relation of thyroid gland to hemopoiesis. Special interest is shown in the role of vitamins other than K in blood coagulation time. It now seems hypervitaminosis A is responsible for spontaneous hemorrhage in rats. Simultaneous administration of vitamin K with A is effective in the control of bleeding time. Depletion of vitamin C in guinea pigs caused increased fibrinogen content of the blood.

AMERICAN JOURNAL OF PUBLIC HEALTH

Vol. 36, March 1946

* Public health aspects of dehydrated foods. Report of the Committee on Foods (except milk).—p. 248.

Vol. 36, April 1946

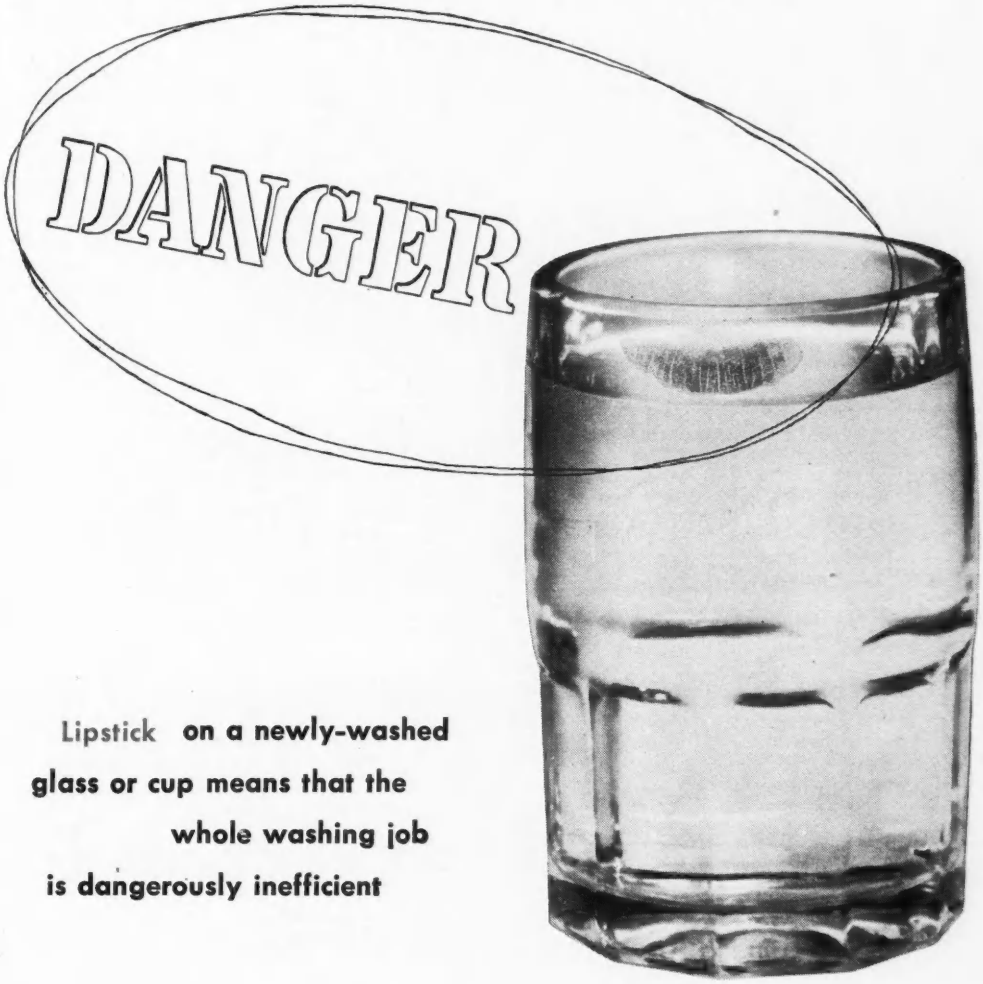
* Microbiological examination of foods. Report of the Committee on Standard Methods for the Microbiological Examination of Foods.—p. 332.
* Health Education. L. K. Frank.—p. 357.

Infectious Hepatitis—Presumably food-borne outbreak. M. R. Reed, H. Bancroft, J. A. Doull and R. F. Parker.—p. 367.

Public Health Aspects of Dehydrated Foods. Because of the rapid expansion in the production of dehydrated foods, little attention has been devoted as yet to their public health aspects. Since dehydrated foods are to continue to have a place in the dietary some study of their nutritive and microbiological aspects has been made. As far as can be determined there have been no cases of food poisoning arising from the consumption of dehydrated foods. Nevertheless, *Salmonella* and *Staphylococci* have been found in certain types of dehydrated foods and it is believed that foods containing such organisms should be considered potential vectors of food poisoning. In the light of present information it can be said that losses of vitamins, especially ascorbic acid and thiamin during the commercial production of dehydrated vegetables are large. Future studies on vitamin loss need to be made on foods that have been dehydrated for different periods of time.

Examination of Foods. Full details concerning tentative methods for the microbiologic examination of frozen vegetables and fruits are given.

Health Education. This article outlines the present day concept of health education from infancy throughout the various age groups, in both sexes. All facets of health education (nutrition, mental hygiene, sex education) are discussed. The importance of reorienting and reeducating at all age levels, and in many social groups and cultures is emphasized, and the necessity for progressive elimination of "health ideas" based on proverbs, folklore, and faulty preconceived ideas is stressed. The material presented is of especial usefulness to dietitians and nutritionists whose work is actively integrated into the educational aspects of health programs such as infant and maternal welfare, schools and colleges, public health work, clinics and hospitals.



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CANADIAN JOURNAL OF PUBLIC HEALTH

Vol. 37, March 1946

* A study of nutritional conditions in a group of urban children. H. J. Leeson, R. V. Crawford, J. F. Webb, F. Swan, J. E. Davey, L. A. Clarke, and E. W. McHenry.—p. 97.

Nutritional Conditions in a Group of Urban Children. Two groups of children were examined for evidence of malnutrition. In the underweight group 83 per cent were considered to be in unsatisfactory condition. In the normal and overweight group 20 per cent were also so classified. The most common defect was that of definite underweight with poor muscle tone and other evidences of sub-optimal health. Considerable incidence of dental caries was evident in both normal and underweight groups. Hemoglobin levels were lower than is generally considered satisfactory. Mild thyroid enlargement was seen in about one-fourth of the adolescent girls with 4 cases probably pathological. The use of milk, meat, and eggs was reasonably good but the consumption of fruit, vegetables and cereals of high nutritive value was poor. Most of the children were receiving inadequate breakfasts and noon meals. The consumption of soft drinks, pastry and candy was high.

THE CANADIAN MEDICAL ASSOCIATION JOURNAL

Vol. 54, April 1946

* Scurvy in a Cree Indian. C. Corrigan.—p. 380.

Scurvy. A case of scurvy is presented, with colored photographs showing typical hemorrhagic lesions of the gums and legs. Pictures taken before and after therapy are shown. Bleeding and swollen gums were noted at the same time as petechiae and ecchymoses. The case responded to vitamin C therapy. The deficiency state appeared to have been exacerbated by pregnancy.

GASTROENTEROLOGY

Vol. 6, February 1946

* The total solids, fat and nitrogen in the feces. II. A study of persons who had undergone partial gastrectomy with anastomosis of the entire cut end of stomach and the jejunum. E. E. Wollaeger, M. W. Comfort, J. F. Weir, and A. E. Osterberg.—p. 93.

Fat Absorption in Persons with Partial Gastrectomy. Persons in this study who had undergone gastric resection and anastomosis of the entire cut end of the stomach to the jejunum lost more fat in the stool when taking a diet high in fat than did those who had not undergone an operation on the stomach. This loss occurred in patients who complained of no symptoms referable to their digestive tracts but tended to be greater among patients who had postoperative digestive complaints. Excessive loss of fat in the feces was also observed on diets of ordinary fat content. Some of the patients who had undergone partial gastrectomy and anastomosis of the entire cut of the stomach to the jejunum lost more total nitrogen and total solids in the stools than the patients who had not undergone an operation on the stomach. The excessive amounts of fat and nitrogen in the feces were not large in most instances, but unless a diet of sufficient caloric content were taken to compensate for the loss, a decrease in body weight might be expected.

HOSPITALS

Vol. 20, April 1946

* Control of crying in the nursery. C. A. Aldrich.—p. 68.
Implementing good personnel relations. C. Heyel.—p. 80.

Neonatal Crying. The subject of neonatal crying was investigated by workers in the Rochester Child Health Project (Mayo Clinic) during 1944 and 1945. Four separate reports were made on (a) the community phase of crying in the neonatal nursery; (b) the individual phase of crying in the neonatal nursery; (c) crying in the babies' homes immediately after their dismissal from the hospital; and (d) a repeat observation in the nursery with the help of additional nurses. This paper is a resume of all 4 reports and the following conclusions were drawn: 1. In the neonatal nursery, crying appears in reciprocal relation to the nursing care. 2. Neonatal crying does not appear to be contagious from one baby to another. 3. Lack of synchrony between pediatric and obstetric routine was responsible for some crying peaks. 4. The babies varied greatly in the amount of their crying. 5. While hunger appeared to be an important factor as a cause of crying, it did not predominate and was almost equalled by unknown reasons. 6. Prolonged crying spells were much less frequent in the homes than in the hospital nursery. 7. In the follow-up observation with an increase of actual professional nursing care of from 0.7 hr. per day per baby to 1.9 hr. per day per baby, the average number of minutes of crying daily per baby was reduced from 113.2 to 55 min., a decrease of 51 per cent. 8. It is possible by individualizing the care of newly born babies and adjusting nursery and obstetrical floor routines, to reduce the amount of crying.

JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION

Vol. 130, March 23, 1946

* Supradiaphragmatic section of vagus nerves. T. F. Thornton, E. H. Storer, L. R. Dragstedt.—p. 764.
* Effect of synthetic lactobacillus casei factor in treatment of sprue. W. J. Darby, E. Jones, H. Johnson.—p. 780.

Vol. 130, March 30, 1946

* The oral manifestations of iron deficiency. W. Darby.—p. 830.

Vol. 130, April 13, 1946

* Health of repatriated prisoners of war from the far east. H. J. Morgan, I. S. Wright and A. van Ravenswaay.—p. 995.

Vol. 130, April 20, 1946

Hospital service in the United States. Twenty-fifth annual presentation of hospital data by the council on medical education and hospitals of the American Medical Association.—p. 1073.

Section of Vagus Nerves in Ulcer Therapy. A total of 38 patients with duodenal ulcer, gastric ulcer, or gastro-jejunal ulcer have been treated by complete division of the vagus nerves to the stomach with complete relief of ulcer symptoms. Objective evidence of healing of the ulcers, and definite improvement of general health occurred in almost all cases. Studies done on these patients indicated that: (a) A continuous secretion of gastric juice is a normal phenomenon. This may be due to secretory stimulation by the vagus nerves. In patients with gastric and duodenal ulcers, this secretion is much greater than in normal man. (b) Certain agents (caffene and histamine) increase gastric secretion and motility even after secretion of the vagus nerves, apparently by action directly upon the secretory elements of the gastric mucosa (c) The gastric hyper-secretion of ulcer patients is chiefly neurogenic in character and is much reduced by section of the vagus nerves to the stomach.

L. Casei Factor in Sprue. Three cases of sprue are reported which were treated with a synthetic *Lactobacillus Casei* factor. In all cases response began immediately, and was progressive, virtually all of the classic signs of the disease disappearing under this therapy. This response is comparable to that observed with liver extract therapy.

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Present evidence suggests that the administration of this *L. casei* factor may result in a satisfactory response in cases of sprue, pernicious anemia, pernicious anemia of pregnancy, and nutritional macrocytic anemia—all conditions which are characterized by a megaloblastic arrest. The resemblance of sprue to vitamin M deficiency in the monkey has led the authors to believe that the latter is the experimental analogue of sprue, and they propose that the group of substances related to the *L. casei* factor and "folic acid", and which exhibit hemopoietic activity for primates be termed the "vitamin M group."

Iron Deficiency. A report of six cases is given, the purpose of which is to present evidence that atrophic lingual papillae, glossitis and/or angular labial fissures which accompany iron deficiency anemias are often due to the lack of iron alone and not to accompanying vitamin B complex deficiencies. Certain of these cases responded to iron therapy alone; others responded to iron administration after they had failed to yield to prolonged intensive treatment with various B vitamin preparations. The author states that stomatitis due to iron deficiency is now encountered much more frequently in the Vanderbilt Hospital Nutrition Clinic than is riboflavin or niacin deficiency cheilosis and glossitis. He also believes that iron deficiency should be considered in the interpretation of the significance of such oral changes as are recorded in nutrition surveys.

Repatriated Prisoners. A careful health survey of 4618 American prisoners released from Japanese prison camps at the completion of hostilities was made. It was believed that a survey might be of value in helping to determine the best future care for them, the possibility of the prevention of the spread of communicable conditions, and a better understanding of the changes which take place in man after exposure to such living conditions. Significant findings and clinical impressions noted were that: (a) There was a faulty nutritional state, including marked loss of weight, and muscular wasting. (b) The deficiencies from which these patients suffered were multiple; therefore any attempt to classify the findings in light of specific vitamin, protein, or mineral deficiencies is fraught with hazards of misinterpretation or overinterpretation. (The lesions which may have been due to deficiency diets with their incidence is listed.) (c) Wet and dry beriberi occurred with great frequency. (d) There were neurologic changes, a high incidence of pulmonary tuberculosis, dermatologic manifestations and psychologic changes. Significant laboratory findings included a high incidence of infestation with intestinal parasites, anemia (especially macrocytic) and eosinophilia.

THE JOURNAL OF CLINICAL INVESGITATION

Vol. 25, January 1946

* The anemia of infection. I. Hypoferremia, hypercupremia and alterations in porphyrin metabolism in patients. G. E. Cartwright, M. A. Lauritsen, P. F. Jones, I. M. Merrill, and M. M. Wintrobe.—p. 81.
* Hepatitis without jaundice in infectious mononucleosis. C. Cohn and B. I. Ledman.—p. 145.

Anemia in Infection. According to the author, the anemia of infections in humans is associated with hypoferremia and is accompanied by an increase in the content of copper in the serum, as well as by coproporphyrinuria and an increase in erthrocyte protoporphyrin. The theory is offered and evidence is presented that the anemia of infection is due to failure to form heme as the result of a lack of iron to incorporate into the protoporphyrin molecule. This lack may be due to an abnormality in the intermediate metabolism of iron which diverts this metal to the tissues and makes it unavailable for hemoglobin synthesis.

Hepatitis without Jaundice in Infectious Mononucleosis. The treatment of 15 patients with hepatitis without jaundice in infectious mononucleosis consisted essentially of rest, diet, and a high intake of the vitamin B complex in balanced form. The diet consisted of carbohydrate 400 gm., protein 150 gm., and fat 35 gm. The proteins used were high in methionine and included casein and egg white. The fats were rich in unsaturated fatty acids and cholesterol. Supplemental feedings of casein in skim milk were given. The vitamin B complex was included in the diet as whole brewers' yeast. All patients save one on whom it was possible to carry sereal studies to completion have demonstrated a return to normal hepatic function.

JOURNAL OF NUTRITION

Vol. 31, March 1946

* Mental response to added thiamine. Ruth Harrell.—p. 283.
* Apparent prolongation of the life span of rats by intermittent fasting. A. J. Carlson and F. Hoelzel.—p. 363.
* The effect of different grades of cocoa upon the retention of dietary calcium by growing rats. H. H. Mitchell and T. S. Hamilton.—p. 377.

Mental Response to Added Thiamine. This paper is an account of an experimental study of psychological response to liberal thiamine intake in children of school age. During three separate periods of time, the effect of daily supplementation of the dietary of children in an orphanage was observed. Two mg. of thiamine per child was administered. On several days during two of the periods, the basic orphanage diet was surveyed and the thiamine intake per child was calculated as .9 and 1 mg. In the study 37 to 55 carefully matched pairs of children were used, one member of each pair receiving thiamine and the other a placebo. Measurements of performance included acuity of vision, skills at games, reaction time, reading, arithmetical processes, memorizing and forgetting, intelligence tests and other recognized psychological tests. In the first 6 week-period the vitamin fed group made superior average gains in performance in every one of the 18 test tasks. In the second one-year period 15 activities were used and the vitamin fed group again surpassed the control group in gains in performance of every activity. The superior gain of the vitamin fed group was statistically significant for 8 of the 15 activities. In the third one-year period 20 pairs of children were continued with the same regimen as in the previous year while 20 pairs were so reversed that those who had received thiamine now received a placebo or vice versa. The unreversed pairs continued as before; the reversed pairs showed reversals of superior gain in 7 activities but failed to show adverse effects of withdrawal of thiamine in intelligence tests, educational achievement, reaction time, height or weight gains.

Intermittent Fasting and Longevity. Tests were made in which one group of 33 rats were fed ad libitum and 2 groups of 37, and one of 30 rats were fasted 1 day in 4, 3, and 2, respectively. After the age of 42 days, it appeared that the apparent life span was increased by the intermittent fasting. The optimum amount of fasting appeared to be 1 day in 3 and this increased the life span of littermate males about 20 per cent and littermate females about 15 per cent. No drastic retardation of growth was produced by the intermittent fasting.

Cocoa and Retention of Dietary Calcium. The effects of 3 different kinds of cocoa (a low cost American process breakfast cocoa and 2 medium cost products, an American process breakfast cocoa and a Dutch process cocoa) on calcium retention in growing rats were studied in 2 experiments. In the first experiment, the effect of the 2 medium cost cocoas on the retention of the calcium and phosphorous of milk was studied with 9 trios of rats, trio mates receiving equal amounts of their respective diets. In the second experiment, the effect of the low cost cocoa was assessed with 12 pairs of rats, also receiving equal amounts of their respec-

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*Based upon (1) the Report of the Council on Foods and Nutrition, J.A.M.A. 126:100, 1944, J.A.M.A. 123:902, 1943 and (2) the label statements of composition of better-known pre-cooked cereals.

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tive diets. The 2 medium cost breakfast cocoas containing 22 to 24 per cent fat, depressed calcium assimilation in growing rats in proportion to their contents of oxalic acid. The cocoas themselves contained enough calcium to combine with 54 per cent of their content of oxalic acid. The low cost cocoa containing 10.58 per cent fat depressed calcium assimilation to an extent about 3 times as great as could be accounted for by its content of oxalic acid. The latter cocoa depressed the growth of rats also to a distinctly greater extent than the former 2 cocoas. No distinction between the 2 medium cost cocoas with reference to their effects upon growth or calcium metabolism, was established.

THE MILITARY SURGEON

Vol. 98, March 1946

* Three and one-half years of nutrition activities in the eighth service command. W. L. Hart, and R. D. Daggs.—p. 214.

Nutrition Activities in Eighth Service Command. This article discusses the activities and accomplishments of 50 nutrition officers assigned to the service command for the education of army personnel in nutrition. The work of these officers not only helped maintain an optimally healthy army and made thousands of men nutrition conscious, but has probably changed the eating habits of thousands who will continue these habits and thus lead to a healthier post war population.

NUTRITION ABSTRACTS AND REVIEWS

Vol. 15, January 1946

* The amounts of Vitamin B_1 in cereals and the extent to which they supply human requirements in various dietaries. W. I. M. Holman.—p. 387.

Vitamin B_1 in Cereals. This article is an excellent review, coordinating available knowledge and indicating where amplification or confirmatory evidence is still required. The review includes methods of assay, units and standards, vitamin B_1 content of cereal grains, effect of milling and other processes upon the vitamin B_1 content, human requirements, proportion of cereals in human diets, contribution made by cereals in the diets of various communities to the total requirement for vitamin B_1, and methods of increasing the vitamin B_1 content of flour and bread. A comprehensive bibliography is included.

PUBLIC HEALTH NURSING

Vol. 38, March 1946

* Nursing auxiliaries aid safe milk campaign. M. Charlebois.—p. 123.

Nursing Auxiliaries Aid Safe Milk Campaign. With the aid of 43 women who comprise nursing auxiliaries, public health nurses of Olmsted County, Minnesota, have started a campaign by giving demonstrations of home pasteurization of milk at county fairs and Farm Bureau meetings. It is hoped that by the end of the year every rural family will have the opportunity to see a demonstration on heat treatment of milk in the home and become aware of the dangers of raw milk.

PUBLIC HEALTH REPORTS

Vol. 60, April 12, 1946

* Sequestration of calcium and magnesium in the presence of alkaline detergents. E. H. Mann and C. C. Ruchhoft.—p. 539.

Water Hardness During Dishwashing. The effectiveness of 3 sequestering agents in preventing the formation of hardness films on utensils during washing operations in solutions of alkaline detergents was studied. In general it was found easier to sequester magnesium than calcium, and that sequestering ability was reduced at the higher temperatures. Sodium hexametaphosphate and sodium tetraphosphate were equally effective in respect to calcium, while sodium pyrophosphate was less effective. Tests in actual washing procedure indicated that precipitation during the rinse results in the formation of films on cleaned utensils. This makes essential the use of large proportions of these sequestering agents in detergent mixtures in order to prevent precipitation of water hardness on the utensil.

SOUTHERN MEDICAL JOURNAL

Vol. 39, March 1946

* The substitution of thymine for folic acid in the treatment of macrocytic anemias in relapse. T. D. Spies, C. F. Vilter, J. K. Cline, and W. F. Frommeyer.—p. 269.

The Substitution of Thymine for Folic Acid in Macrocytic Anemias in Relapse. Thymine (2,3-dehydroxy-5-methylpyrimidine) has long been recognized as an integral portion of the biologic cell occurring as part of nucleic acid. J. L. Stokes has suggested that folic acid acts as an enzyme or coenzyme in the synthesis of thymine or a thymine-like compound which is used by the bacteria to form nucleic acid and that offering of large amounts of thymine alone enables this material to be used "directly as a building block," folic acid no longer being needed for growth. Six patients with nutritional macrocytic anemia and the anemia of sprue were given 5 mg. to 50 mg. of thymine daily for 10 days. There was no clinical or hematological response. One patient with macrocytic anemia in relapse was given 500 mg. orally twice a day for 6 days. There was no response. The dose was increased to 2 gm. 3 times a day for 14 days. After 20 days of treatment the reticulocytes subsided and the erythrocytes and hemoglobin leveled off at 2.88 million and 10.4 gm. (68 per cent) respectively. The bone marrow reverted from that of megaloblastic arrest to normal.

REVISTA DE MEDICINA DO RIO GRANDE DO SUL (BRAZIL)

Vol. 1, March-April 1945

* Anorexia in infancy. Leal de Morais.—p. 231.

Anorexia. Anorexia in the nursing infant differs from that observed in older children, and should be studied separately. Anorexia may develop progressively or appear suddenly, and may continue for days or even for years. It is more common among babies fed artificial formulas than among those receiving mother's milk. Malformations of the mouth, rhinopharyngitis, retropharyngeal abscesses, muscular weakness, etc., may be causes. In rare cases the sucking reflex is lacking. Causes of anorexia in infants may be divided into 5 classes: (a) disturbances of the general condition; (b) infections; (c) digestive disturbances; (d) local disturbances; (e) nervous or mental conditions.

Treatment depends on the condition. Good general hygiene, calm surroundings and an exact feeding schedule are important. Forcing food, or depriving the infant of food for 12 to 24 hours, as recommended by German authorities, are undesirable and unsatisfactory methods. Fruit juices, vegetables, brewers' yeast, are helpful in bringing up vitamin quotas. B_1 and B_2 deficiencies increase anorexia and tend to bring about a secondary gastritis. Injections of B_1 and B_2 given after meals, are of great value in reducing anorexia. Iron is also useful, especially in cases of anemia. The use of bitter drops and digestive tonics have been discarded. Under certain conditions salt added to the milk is effective. Liver extract and insulin may be given in certain cases. With cerain chronic infections such as syphilis, lactate of mercury is prescribed. Patience and education are the best treatment for anorexias of nervous origin.

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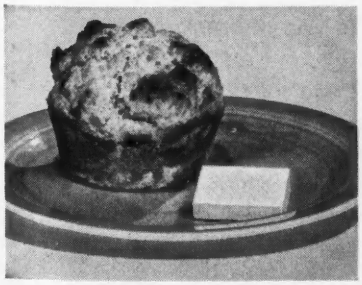

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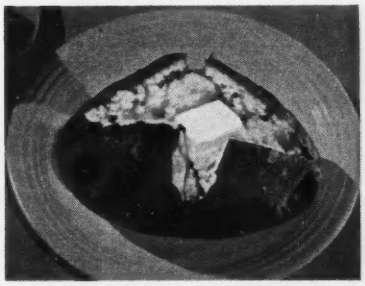

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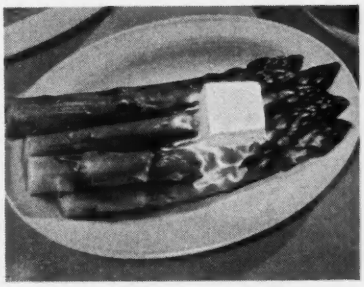

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BAKER'S HELPER

Vol. 85, Feb. 23, 1946

* Outlook for bakery equipment for 1946. M. Miller.—p. 39.
* Engineering the bakery for sanitation. E. M. Voorhees.—p. 62.
* Producing acceptable baked foods from 80 per cent flour. R. Gaylord.—p. 92a.
* Puff pastry method for low-moisture butter. W. E. Broeg.—p. 100.

Vol. 85, March 9, 1946

Puff pastry method for low-moisture butter. W. E. Broeg.—p. 56.
Outlook for ingredients and supplies.—p. 92.

Bakery Equipment for 1946. Manufacturers of bakery equipment announce new improvements. One manufacturer describes improvements in ovens resulting in even heat distribution, automatic flexible temperature control, dual ventilation, and a more streamlined appearance. The ovens are designed for gas and are fired with direct, semi-indirect, and indirect heat. They are also built for oil and coal with indirect heating and can be fired with electricity. Another manufacturer announces a two-in-one combination proofing room and dough room. Each unit can be used separately or in combination. A new filter is also described which filters fats and oils used for all purposes. The latest model is equipped with a fat transfer pump for transferring heated fat into the filter chamber, thus eliminating the handling of hot fat. The filtered fat is forced back into the fryer by the pressure formed in filtering. An automatic dough greaser has been designed to eliminate the greasing of pans. It is a movable, all-metal frame, which supports a conveyor belt. The belt receives pieces of dough as they are discharged from the molder and delivers them to where they are panned. Above the conveyor belt is an oiling belt. It can be adjusted for different sizes of dough. A feature of the greaser is the oiling of the ends of each piece of dough. These are only a few of the many new pieces of equipment that will be available as soon as the necessary materials are produced.

Sanitation in the Bakery. Bake shops usually lack storeroom and working space. Floor drains for rapid cleansing seldom are provided and equipment space is inadequate. Bake shops should observe these rules of sanitation: 1. Every bench and piece of equipment should be on wheels. There should be closets in place of shelves. Drainage facilities should be available. 2. The storeroom should be a separate part of every bakery. All dirty work, as pan cleaning, should be done outside the workroom. 3. Oven firing should be done from the rear. 4. The responsibility for keeping the shop clean should be placed on definite individuals.

Baked Goods from 80 per cent Flour. Much experimentation has been done with this flour, but still more is necessary. The absorption requirements of the 80 per cent extraction flour are less than that of normal flour. Sponges should be stiff and doughs firm for best results. Mixing time for full development will be less. About 50 per cent less mixing time should be allowed. The new flour is sensitive to youngness at any stage throughout fermentation. It has good tolerance to extra fermentation. The doughs will have more pliable, mellower, deader handling qualities. For best moulding a reduction in overhead proofing time may be desirable. The new flour produces a short break and shred. It colors faster in the oven, therefore slightly lower baking temperature and increased baking time should combat this feature. Formula changes will involve increased amounts of mineral yeastfoods, a decrease or entire elimination of malts, normal amounts of shortening, and smaller amounts of milk solids or none at all.

Puff Pastry Method for Low-Moisture Butter. The European method of rolling the butter on the outside of the dough in making puff pastry and Danish pastry never gained popularity in the United States because it was much more complicated than putting the fat mixture inside the dough. In Europe, the butter and dough were chilled to the same degree of stiffness. The dough was placed on top of the butter block and the two were rolled. Each time the two were rolled, more layers were developed and this was supposed to give a better colored, more flaky piece of crust. Tests have failed to disclose any advantages to this extra work. In America, chilled flour and shortening are mixed, forming lumps the size of an egg, then adding the eggs and water until a loose, dry dough is formed. It is very important to build up multiple layers of flour and fat. Flour with strong gluten produces best results.

BUILDINGS AND BUILDING MANAGEMENT

Vol. 46, March 1946

* Basic standards for good lighting. L. E. Varner.—p. 38.
* Values of illumination.—p. 38.
* Modern lamps and their characteristics.—p. 29.

Good Lighting. Light available for seeing is the light reflected by the background minus the light reflected by the object. In designing a lighting system, it is important to decide the level of illumination desired. Brightness of surroundings is one of the most important factors to be considered, especially where the workers must use their eyes constantly. The contrast between the work and the surroundings should not be too great. Many expensive offices with dark furniture and paneling, are the least desirable from the lighting standpoint. Glare can be corrected by increasing the levels of illumination and brightening the surroundings. Light color has little effect on seeing conditions. Yellow light has a slight advantage over other light for detail work, but for normal seeing conditions this advantage disappears.

Values of Illumination. Light value recommended for certain areas depends upon the size of the object, the back ground and surroundings, the length of time the worker is spending, the age of the worker and the condition of his eyes. In all lighting installations, some form of reflection and diffusing equipment is needed. Lighting units vary in types and prices. In making a selection, it is wise to consider all the factors mentioned above.

Modern Lamps. The incandescent light is the cheapest to install, but lasts the shortest time. It starts instantly, has a high per cent of radiant heat, gives bright and concentrated light, but is more easily controlled. The high pressure mercury tube, standard fluorescent lamp, and the cold cathode fluorescent lamp are costly to install at the beginning, but have a much longer life than the former lamp. The cold cathode fluorescent lamp is the only one of the three that lights instantly. The light of the high pressure mercury tube is too bright to use unshielded, but is easily controlled and redirected. The light source of both the standard and the cold cathode fluorescent lamp is large in area and difficult to control and redirect.

CHAIN STORE AGE

Vol. 22, March 1946

* Printed order forms cut stock work. A. H. Bleier.—p. 21.

Vol. 22, April 1946

* How chains are cutting costs.—p. 13.

Printed Order Forms. The Central Drug Stores, Inc., New Kensington, Pa., has started to use printed order forms. All the merchandise is listed on the forms. They are first listed according to department and then according

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to the groups within the department. The order forms list brands and items under the classifications in alphabetical order, with sizes and the manufacturers' retail prices. The current cost price per unit is also listed.

Streamlining Store Inventory. Accurate inventories taken periodically are one of the most important methods of cost control. By using the portable recording machines, records will be more accurate. Writers will not be distracted from their work. Time for taking inventory will be lessened because the items can be recorded no matter where they are found and classified later. More information about the merchandise can be obtained because the workers are supposed to report any unusual stock conditions. Because the time is shortened by using these recorders, inventories can be taken more often. It is very important to know what stock is on hand before ordering. Each kind of merchandise is recorded in the same place every time, so that comparisons with past inventories can be made. The workers must be trained to use these recording machines correctly, and care of the equipment must be taught in case there is a breakdown. In case there is a breakdown, counts are kept on printed books until repairs are made. The recording machines have to be adapted to the special needs of each store because of the various kinds of stock handled. Research has found this short cut method to be within .02 per cent accuracy.

Another store saves the claims received from damaged merchandise for six months and then collects them, saving time by answering all at once.

FOOD INDUSTRIES

Vol. 18, April 1946

* New flour requires some baking adjustments. R. T. Bohn.—p. 76.
* Electronic heat in the food industries. V. W. Sherman.—p. 90.
* Food plant sanitation is not just a chore. M. E. Parker.—p. 94.
* "Undercooling" retards of freezing of canned foods. Report of U. S. D. A., Division of Fruit and Vegetable Crops and Diseases.—p. 97.

New Flour Baking Adjustments. Some of the problems the baker may look for in using 80 per cent extraction flour, and some of the uncertainties that must await developments, are outlined. A close watch on fermentation, mixing, and yeast food requirements will be necessary to achieve top quality products.

Electronic Heat. The applications of electronic heating to food processing, such as defrosting, cooking and baking, melting, mold inhibition, deinfesting, dehydrating, caramelizing, and sterilizing are discussed in this article. The author answers many pertinent questions regarding electronic heat such as: what's new, special, or better about it? How does it work? How about maintenance and operating cost of electronic heat equipment? Popular misconceptions about electronic heating are listed.

Sanitation. This second of two installments discusses housekeeping and antisepsis in the food plant.

Undercooling of Canned Foods. Recent research has shown that the well known phenomenon of undercooling almost always saves the fruits and vegetables from immediate damage, when exposed for short periods to temperatures well below the freezing points of the materials in the cans. The true freezing points, however, must be taken into consideration whenever storage is prolonged. New data are now available on the freezing points of canned and bottled goods, which will facilitate storage and shipment in cold weather. Data sheets are included showing the extent of undercooling, freezing points, and effect of freezing on apple sauce, asparagus, and various kinds of canned beans. Data sheets on other commodities will be included in succeeding issues.

THE HOTEL MONTHLY

Vol. 54, March 1946

* Semi-formal dining room has counter section.—p. 42.
Williamsburg Inn opens to civilians again.—p. 59.
* Short course in hotel personnel management.—p. 70.
* Financial history of hotel business published by A. H. A.—p. 77.
Lobsters by air from Maine to market.—p. 82.

Semi-Formal Dining Room. An entirely new idea in hotel facilities is found in the remodeled and redecorated Cafe Rouge, Hotel Statler, Buffalo, New York. One section of this dining room has a counter section that will accomodate 30 patrons, while the remainder of the dining room will seat 230. The dining room is decorated in rich color; the ceiling is soundproof. The kitchen has been redecorated and new equipment added. The patrons are able to see the clean and modern facilities where the food is prepared for service.

Hotel Personnel Management. The Illinois Women Hotel Managers and Executive Housekeepers, Inc., are cooperating with the Illinois Hotel Sales Managers Association in a 3-day course in hotel personnel management. The purpose of the course is to bring about greater cooperation between the departments and to improve employer-employee relationships.

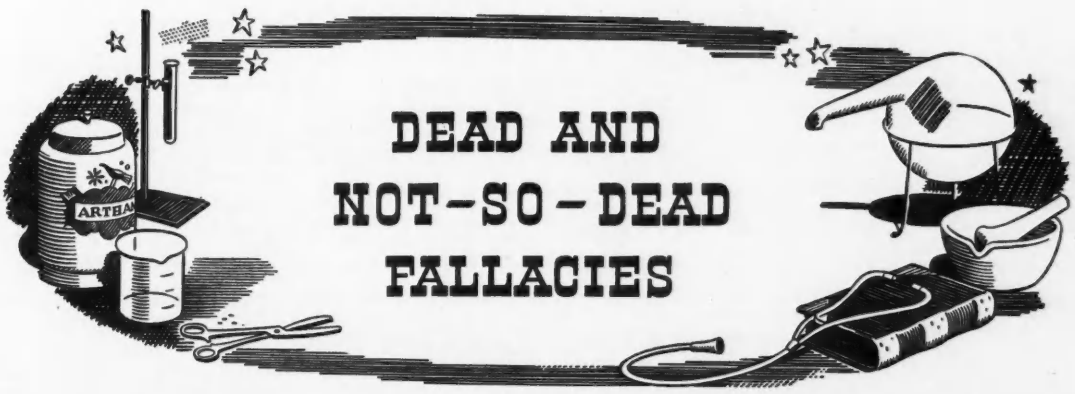
History of Hotel Business. "The Future Outlook of the Hotel Industry," published by the American Hotel Association, portrays the economic factors behind the hotel business. A chapter is devoted to the future of the hotel business. A check list for those who plan to build a hotel contains the following points. Have a market analysis made by a reputable firm; let the organization that made the market analysis guide you as to the size, type and character of the hotel; examine any estimate of the hotel's future earning power; make allowances for the new hotel's competition from existing hotels; be sure that the hotel is soundly financed; insist that plans and specifications be made and supervised by an experienced hotel architect; make certain a competent operating and managerial personnel is employed to manage the business.

THE ICE CREAM TRADE JOURNAL

Vol. 42, February 1946

* Trends in the future development of the industry. P. H. Tracy.—p. 30.
* Storing ice cream ingredients. R. J. Ramsey.—p. 32.
Management's responsibility for quality. J. H. Erb.—p. 62.
* Citrus fruit used in ice cream. B. I. Masurovsky.—p. 74.

Dairy Industry Trends. The chief aims of the dairy industry are to improve quality and reduce costs of production. Bacteria count, cleanliness, food value, and flavor determine the quality of milk and milk products. One of the most important problems which confronts cattle men is that of controlling disease. Mastitis has affected from 20 to 25 per cent of the cows, and besides raising the cost of milk production, it has resulted in an inferior milk. Cream production is probably the biggest problem in the dairy industry. The farmers have been using old methods in its production; they have little knowledge of the principles of sanitation; their equipment is inadequate and they may not be educated. It is advocated that a system of uniform prices be introduced to raise the standards of the quality of raw milk for the manufacturing industries. Proper control of the production of milk and cream, the enforcing of proper buying standards would produce better milk products, as would large scale production, since laboratory control is then essential. In the ice cream industry, it is the products that are used to make the ice cream that affect the quality. Here, too, laboratory control and supervision of operations will play an important part in the control of the quality of ice cream manufacture.



Snake bites were often treated with big swigs of whiskey which old-timers thought to be a cure. Probably this "cure" hastened many deaths, because the alcohol increased the rapidity with which the poison was absorbed by the body.

A fallacy commonly accepted as true today is that canned foods contain preservatives. Of course, the actual fact is that the processing of canned foods kills spoilage organisms. And hermetic sealing of cans prevents contamination from outside.

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Ingredient Storage. Good frozen cream will keep from 6 to 9 months. When storing frozen cream, it is important that there be no lipase action. Store only cream produced after cows are on grass; store no cream higher in bacterial count than 10,000 per c.c. with a good flavor and low acidity; store high fat cream; use paper cans of special construction; use only stainless steel equipment and keep storage room at least 10°F. Plastic cream is obtained by special methods of processing. The cream is separated to produce a high butterfat product. It requires special equipment and for that reason is not practical for general use. Butter is most commonly stored as sweet butter. Four important factors for the storage of butter are listed. Proper storage information is also given for butter oil, condensed milk, milk powder, and solid products which are not fat. The article contains additional valuable factual data pertaining to ice cream production and storage.

Citrus Fruits in Ice Cream. Citrus flavors in sherbets and ices have a real sales appeal. Orange products, such as candied peel, marmalade, and mixtures such as orange pineapple are used in ice cream while orange juice is used chiefly in ices and sherbets. Lemon juice is handled in the same way as orange juice and is blended with orange juice in the manufacture of orange sherbets and ices to give a pleasant tartness to the product.

INSTITUTIONS

Vol. 18, January 1946

* Meet the new meats; once Army rations, soon civilian food.—p. 15.
* New milling method for rice preserves its vitamin content.—p. 18.
* 24 millions of meals served by railroad's rolling restaurants.—p. 36.

New Canned Meats. At the beginning of the war there were about 12 different kinds of canned meats. Today there are about 40. Bacon was one of the most popular items on the list. Some of the other foods are ham and candied sweet potato dinner, pork and applesauce, beef and gravy, beef and vegetables, chicken and vegetables, ham with raisin sauce and hamburgers.

New Milling Process. A new milling process, called the "Malek" process has been developed. This makes it possible to have white rice as nutritious and beneficial as the unpolished rice.

Rolling Restaurants. The Union Pacific Railroad served more than 24,000,000 meals last year. These were served not only to passengers, but the best meals went to men out on the tracks. They had fully equipped kitchens on cars to take care of the preparation of these meals.

PERSONNEL JOURNAL

Vol. 24, March 1946

* Personnel paradoxes. J. H. Frost.—p. 329.
Veterans in industry. G. E. Tucker.—p. 334.
Tragic mistakes in conferences. C. S. Slocombe.—p. 348.

Personnel Paradoxes. Companies should provide for a rapid promotion system within their own company or even outside if necessary. The worker should be convinced that his services are being sought. A feeling of fraternization and friendliness needs to be developed. Every man likes to feel that others are interested in him. The policy of paying a worker or compensating him when he is not at his machine needs to be considered. Efforts to make his time at work pleasant and interesting are necessary. Each man needs to have personal satisfaction in his job. Workers should have printed name plates, with the printing large enough to be easily read. Being addressed by name can do much for a worker. He will be made to feel that he is really a part of the organization. Leaders must make their workers feel they have a genuine interest in them and in their work. Recognition on the bulletin boards, in the paper, or ribbons often do more than money bonuses. If it is not possible to give a man a promotion, the small recognitions noted above are especially essential.

WHAT'S NEW IN HOME ECONOMICS

Vol. 10, March 1946

Prepare fruit for a morning bracer. D. E. Shank.—p. 62.
* Select quality fruits for a quality breakfast. E. A. Wodd.—p. 63.
* Food in the news.—p. 67.
* Records for school lunch operated by teacher-manager. R. A. Russell.—p. 106.
* Here, there, and everywhere. W. S. Pendergast.—p. 108.

Quality Fruits. The author explains in detail the important points to know when selecting apples, bananas, berries, cherries, grapefruit, lemons, oranges, grapes, melons, peaches, pears, pineapples, and plums.

Foods and Standardized Quantity Recipes. New products or food developments that will be of interest to home economists are mentioned. Frozen milk may take the place of pasteurized milk in milk-short areas, and for sea travelers. Precooked frozen food will be used commercially. In frozen fruits, sugar helps improve the texture, flavor, and color. Enzyme-converted corn syrup is excellent for frozen fruits. It is sweeter than acid-converted syrup, and does not crystallize and does not have any other flavor which often is found to be objectionable. The U. S. Department of Agriculture has developed a curing process for American cheese. The cheese is cured in half the time it took before. Through selective breeding, the amount of vitamin C can be increased in cabbage. It was further found that in the cooler seasons, more vitamin C is found in cabbage. Food standardization was found to be the keynote of success for a Chicago restaurant. Standardized recipes were developed, stated in the simplest language, since restaurant cooks have often had little schooling. Ingredients are listed in the order used; abbreviations are simple to read; fractions are used as little as possible; measures are used if they are simpler than weights; directions are stated clearly; yields are given in pounds, quarts or gallons; cost per pound or gallon is given with the date that the price was effective.

Records for School Lunch. Records are kept as simple as possible in this particular school lunchroom, since the home economics teacher has other responsibilities. Her job includes everything pertaining to management. Each day she keeps a cashier's daily report, which includes the number of people served, and the amount of money taken in. A record is kept of the number of lunches served to the students who help and the students' names are recorded. A report is made at the end of each month's business showing the financial status of the cafeteria. At the end of the year, the books are closed and the surplus is turned over to the business office of the Board of Education. New equipment is bought as it is needed with the surplus.

Here, There, and Everywhere. The Bureau of Internal Revenue has ruled that cafeterias and other types of lunchrooms which are operated by the state or the public school system may color white margarine and serve it without having to pay a tax. No sign is necessary to be displayed when it is used. Concessionaires, who operate in the public schools, are required to pay a manufacturer's $600 special tax each year with a stamp tax of $.10 per pound on each pound of margarine that is colored. Some states still impose taxes on the use of colored margarine, but the one mentioned refers to the Federal taxes. A good lunchroom manager spends extra time planning, estimating the cost of recipes, and instructing employees to get the most out of a recipe. With increasing costs inevitable, the lunchroom manager should supervise, very carefully, the preparation and service of each meal in the school cafeteria.

NEW!

RY-KRISP REDUCING BOOKLET

including food lists that make it easy to plan low-calorie meals

When you are called on to provide low-calorie diets for patients who are in normal health but overweight, you will find this new Ry-Krisp booklet a great help.

The booklet includes comprehensive lists of foods, together with proper portions, so that it is easy for patients to plan a wide variety of delicious, satisfying meals.

Prepared by recognized nutritionists, the Ry-Krisp diets permit gradual weight loss with safety. Though low in calories, the diets provide the protein, minerals and vitamins as recommended by the Food and Nutrition Board of the National Research Council.

Ry-Krisp low-calorie diets are used by many doctors throughout the country.

FREE! "Design for Reducing" is a 4″ x 6″ booklet including 1200-calorie diet for women, 1800 for men; food lists, menus and recipes. Available free in quantities. See coupon.

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In the special economy size, 624 Ry-Krisp wafers are wax-wrapped in 24-wafer packages. Three wafers cost a little less than one penny . . . and there's no loss from staleness.

Ry-Krisp is an ideal bread in low-calorie diets because each double-square wafer furnishes only 23 calories, yet contains the protein, minerals and B-complex vitamins of whole-grain rye. Light, airy and crisp in texture . . . with a delicious rye flavor . . . Ry-Krisp is a desirable every-meal bread. The only bread of its kind distributed nationally.

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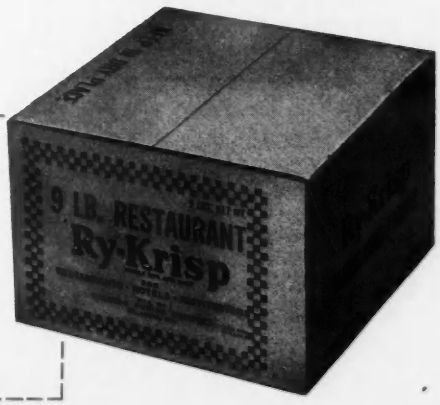

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News Notes

Nutrition Foundation Grants. George A. Sloane, President of the Nutrition Foundation, announced that 14 new research grants, and 9 renewals of previous research grants, totaling $176,700 had been authorized. Harvard University School of Dental Medicine received $15,000 for a period of 3 years to correlate experimental investigations on the relation of nutrition to dental caries in rodents and in laboratory primates, with clinical studies in man. Mount Sinai Hospital, New York City, received $10,000 for a period of 2 years for studies of the relationship of specific nutrients to metabolic disturbances, especially those associated with diabetes. The University of Cincinnati received $10,000 for a period of 2 years for clinical and experimental research on diabetes. The Children's Fund of Michigan received $30,000 for a period of 2 years for a survey of the nutritional requirements of mothers during the reproductive cycle, with additional studies of the composition of human milk. The Florida State Department of Health received $2,500 for public health nutrition investigations and education. The University of Toronto received $15,900 for a period of 2 years for studies of nutrition in relation to degenerative diseases. The Child Research Council of Denver, Colorado, received $30,000 for a period of 5 years for nutrition studies as an integral part of continuous studies of the same individuals from birth to maturity. The University of Wisconsin received $2,000 for studies on the metabolism of fats. The University of California Medical School received $3,000 for studies relating to the fatty liver problem. Alabama Polytechnic Institute received $5,200 for a 2-year period, to study the relationship of a specific dietary deficiency to spontaneous cancer in experimental animals. The University of Minnesota received $1,200 for studies relating to the storage of fat and fat-containing foods for human consumption. The California Institute of Technology received a grant of $13,500 for a period of 3 years, for the development of new biological methods of measuring amino acids and vitamins. Duke University received $3,000 for studies that may lead to a better understanding of the body disturbances related to pellagra. The State College of Washington received $5,000 for a period of 2 years for studies in comparative nutrition—studies that may also play a part in reducing the early loss of 30 to 40 per cent of small pigs which die between birth and weaning time.

Dr. Charles G. King, scientific director of the Foundation, in recommending the grants, said: "With the approval of these grants, the Foundation will have under way 12 studies in the field of human nutrient requirements, 43 studies relating to origins, functions, and the measurement of individual nutrients, 8 studies relating to maternal and infant nutrition, 25 studies relating to nutrition and public health problems, and 6 projects relating to educational and professional training."

Major General Paul R. Hawley Received Appointment. Major General Hawley; who has been acting as medical chief of the Veteran's Administration took over March 4, 1946 as permanent chief of the Department of Medicine and Surgery under General Omar N. Bradley.

Gibson Island Conference. This year's program of the AAAS—Gibson Island Conference will be held June 17–August 24, according to *Science* magazine. Sumner B. Twiss will serve as director. Sessions on vitamins and food and nutrition during July and August will include reports on "Recent Developments in Carotene Research," by F. P. Zscheile; "Some New Tocopherol Effects in Nutrition," by P. L. Harris; "Germ-Free Life as Applied to Nutrition Studies," by J. A. Reyniers; "Some Public Health Aspects of Malnutrition," by L. B. Pott; and "Vitamin Antagonists" by D. W. Wooley.

Food the World Over. This is the series title of a group of 6 booklets to be published by the nutrition service of the Visiting Nurse Association of Brooklyn. The book serves as an aid to nurses, dietitians, and nutritionists dealing with health programs of nationality groups. The first booklet deals with the food habits of Puerto Rico. The second booklet, to be released shortly, deals with Italian dietary habits, and following publications will cover the Jewish, Polish, Syrian and sectional American dietaries. The books are specifically prepared for the use of professional workers in their teaching.

Sugar Substitutes and Savers in Quantity Cookery. Compiled by the Dept. of Institution Management, New York State College of Home Economics at Cornell University, March 21, 1946. A number of recommendations are given for making the wisest use of a scant sugar supply. Numerous suggestions are given for the modification of pudding recipes, cakes and cookies, icings and cake fillings, yeast with quick breads and sweet sandwich spreads. Included is a table of weights and measures of sweeteners and adjustments necessary in baking temperatures, in liquids, and other changes. A second table has been included giving the cost and availability of sugar substitutes and savers in the eastern United States.

Greater Wearability Is Claimed for New Type Flooring. A new hard-surface flooring material, proved to outwear any other popular floor covering now on the market, will be available early this summer. The high points of this Koroseal flooring are easier maintenance, greater wearability and more attractive eye-appeal. Sloane-Blabon advises that although it will be slightly higher in price than the standard linoleum, it is recommended for use in hospitals, schools, hotels, offices, food-processing industries and the like, where long wear and minimum maintenance are of greater importance than the original cost.

Why We Are So Careful About Milk. This is the title of a new teacher's bulletin from the Good Housekeeping Baby Center. Copies may be obtained by writing to the Good Housekeeping Institute, Fifty-Seventh St., and Eighth Ave., New York 19.

Mrs. Little Appointed. The American Dry Milk Institute announces the appointment of Mrs. Madge Little

Developed originally for the Army Sanitary Corps, soon Mi-Kro-Klene will be released for commercial use.

HOW MI-KRO-KLENE WILL GIVE YOU SANITATION NEVER BEFORE POSSIBLE!

SCRUB cream dispensers, fountain fixtures, food mixers, refrigerators with Mi-Kro-Klene. This new germicidal washing compound gets all types of stationary equipment cleaner, safer, more sanitary than ever!

That's because rich-sudsing Mi-Kro-Klene combines detergent and germicidal qualities. Its quick-cleansing powers penetrate hard-to-reach crevices . . . dissolve fats . . . loosen food residue. Most important—Mi-Kro-Klene kills bacteria . . . makes possible a new, higher degree of sanitation and health protection.

Not yet available, Mi-Kro-Klene will be ready very soon. Then you'll use this powerful, new cleansing agent for manual dishwashing, too. Swift germicidal action will hold the wash water to a low bacteria count, reduce the work of the sterilizing rinse, make it easier to obtain more sanitary eating utensils.

MI-KRO-KLENE

EL

ECONOMICS LABORATORY, INC.

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to their staff as home economist. Mrs. Little was formerly on the extension staff of the University of Illinois.

Scheneley Market Oral Penicillin. Two forms of oral penicillin are being made available to physicians and hospitals by the Schenley Laboratories, according to Dr. Charles S. Dutchess, Schenley Medical Director. Penicillin tablets will be supplied in bottles containing 20 tablets of 25,000 units of calcium penicillin each, and penicillin troches Schenley will be available in bottles of 25 troches with 1,000 units of calcium penicillin per troche. Shipments of both items are now being made to surgical supply firms.

Meat for Babies. A canned meat product, strained for infants, diced for juniors, has been perfected by the experimental kitchens of Swift & Company and is scheduled for an early appearance in the consumer market. There are 6 types of meat in the line; beef, calf heart, lamb, veal, pork and liver. Test feedings over the past year have shown that these meats have high acceptance with infants. Booklets with complete information plus samples are available upon request to Swift & Company, Chicago 9.

Kathryn A. McHenry to New Post. Announcement has been made by the Veterans Administration, of the appointment of Kathryn A. McHenry as chief, Dietetic Division, Branch Office No. 7, Chicago. Miss McHenry was formerly chief dietitian at the Veterans Administration Hospital, Hines, Ill. Her new appointment gives her dietetic supervision of the Veterans Administration hospitals in Wisconsin, Illinois and Indiana.

Contributions for Emergency Relief. The emergency food collection on behalf of UNRRA is launching an all-out drive for contributions. Canned foods or money to directly purchase food are acceptable. The purpose of this agency is to supplement the minimum subsistence diets planned for in UNRRA's general relief program. Among the foods needed are: milk (condensed, evaporated, or dried), meat, fish, peanut butter, baby foods, baked beans, stew, soups, honey, fruits, juices and vegetables. Handling and shipping problems restrict the collection to those foods canned in tin. Food collection depots are established in every community in the U. S. Checks or money orders contributions can be sent to the national headquarters of the Emergency Food Collection, 100 Maiden Lane, New York 7, N. Y.

Food and Nutrition News. Published by the National Live Stock and Meat Board at 407 S. Dearborn St., Chicago, this bulletin reports on an interesting diet rating service given workers in industrial plants. The workers fill out blanks, listing the foods they have eaten the day previously, and turn them in to the plant dispensary. The papers are scored by dietitians and returned to the workers accompanied by a printed guide to aid them in choosing future, nutritionally-adequate meals. The Board also reports that experiments prove the lower the temperature in freezing meat, the more tender the meat is and the smaller the drip loss when thawing.

Fiftieth Anniversary. The School of Home Economics at Ohio State University will celebrate the 50th anniversary of its founding this fall. Committees are now being appointed and plans being made for a two-day program of interest to home economists throughout the country.

Poultry and Egg National Board. Consumer Information Service has published an interesting booklet on chickens. Included are sections on methods of cooking, carving, cooking time-table, buying-chart and recipes. This book is of interest at this time because the Famine Emergency Relief Committee is urging the public to ,"Eat more abundant foods, including eggs and poultry." This booklet may be obtained by writing to the Poultry and Egg National Board, 308 W. Washington, Chicago 6, Ill.

Report from Abroad. Diana Ten Haaf, president of the Dutch Dietetic Associations, writes from The Hague that they have received our complimentary subscription to the JOURNAL and also adds how truly "hungry" they are for scientific news of any kind. They are faced with the tremendous task of almost completely rebuilding their scientific libraries after years of occupation by the Germans. Dr. Clement A. Smith, pediatrician of Harvard University, is in Holland at present working on an investigation regarding the results of the famine on pregnant women and their new born babies. Miss Haaf, in company with other Dutch dietitians, and members of the medical profession, is assisting Dr. Smith in his work. Following completion of the investigation, Miss Haaf leaves for study in England and Scotland.

American Meat Institute. An extensive survey has been completed by this organization on the black market in meat, its extent, and cost to consumers. A scientifically thorough study was made in 11 key cities of the U. S. and results were incorporated in this report that carries graphic charts to illustrate the glaring price deficiencies between the OPA and the black market. Booklet is available from The American Meat Institute, 59 E. Van Buren St., Chicago 5, Ill.

AHEA Meeting. The Hotel Statler in Cleveland will be the headquarters for the AHEA 37th annual meeting June 24 to June 27. Benefits to the nation's families through research in housing, household equipment, family economics, and child development will be the theme of the June 24 session. Consumer problems and the world food problems also will be discussed.

Dairy Month. June has been designated as Dairy Month by the National Dairy Council as an occasion for reminding the public of the importance of dairy foods in the dietary. The Council reports that supplies of all dairy foods will be greater during June than at any time of the year. In most areas quantities of milk, ice cream and cottage cheese will be unlimited. There will be more butter and cheese and supplies of cream should be adequate. The Council is urging consumers to use dairy foods whenever possible to replace those in short supply.

Turkey Survey. The National Turkey Federation is conducting a study to determine the place of turkey meat in school cafeterias, hospitals, clubs, restaurants and other institutions. Specifically they want to determine: (1) The relative cost of finished turkey meat in relation to fowl and red meats of various kinds; (2) the relative merits of turkey as a food; (3) approved methods of preparing, handling and serving turkey in large and small institutions, with an eye on the complete utilization of all edible portions; and (4) attractive ways of cooking turkey to create menu variety.

Health Survey. Frances MacKinnon, consultant in nutrition, Inter-American Cooperation Unit, U. S. Department of Labor, has spent a large part of the months of April and May in the Dominican Republic Assisting the Secretary of Health in a small survey of hospital dietary departments, and preparing two or three women to take care of special diets in the same number of hospitals.

Book Collection. The American Book Center for War Devastated Libraries, Inc., has been organized as a medium to help restock the war-devastated libraries of Europe and

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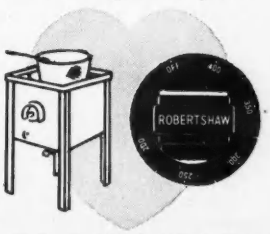

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Human Behavior Toward Food. Food Clinic Dietitians in Chicago have been participating in a study program conducted by Dr. Charlotte Babcock, psychiatrist. The course was planned to cover some of the basic mechanisms of human behavior as related to food therapy. In order that the clinic dietitian might gain a better understanding of the principles of interviewing, Dr. Babcock was asked to include a discussion of technics for developing rapport, for obtaining and recognizing unwholesome attitudes toward food, for attempting to remove or "get around" these unpleasant associations toward food, and for planning with the patient a program of food therapy whih will be more or less automatic and free from stress. The course was sponsored by the Clinic Nutrition Conference of the Council of Social Agencies.

Food Consultant. Christine Pensinger, food consultant for Marshall Field & Co., and member of the American Dietetic Association, has resigned her position at this store to devote her time to free-lance food consulting and radio work. She will make the West Coast her headquarters.

Food Director's Conference. The 11th Food Service Director's Conference will be held in Chicago October 10, 11 and 12 at the Sherman Hotel. Frank O. Washam, director of lunchrooms for the Board of Education, Chicago, will serve as chairman. The conference will include a program of addresses, group meetings, and exhibits of the latest equipment, supplies and foods for institutional feeding units.

Joins UNRRA. Mabel Stimpson, formerly associated with the American Red Cross, has joined UNRRA. She will be stationed in the Displaced Persons Camps in Germany.

Veterans Administration Appointments. Miss Maniza Moore, Chairman, Dietary Advisory Council to General Omar N. Bradley, Administrator of Veterans Affairs, has accepted the position of Chief, Dietetics Division at Veterans Administration Branch Office No. 5, Atlanta, Ga. Her appointment became effective June 1, it has been announced by Dr. Paul R. Hawley, Chief Medical Director, Veterans Administration. A native Tennessean, Miss Moore is a life member and immediate past president of the A.D.A. She was formerly Director of Dietetics at Vanderbilt University, Nashville. Dr. Hawley also announced the appointment of Clara Childress, former head medical department dietitian, Army of the United States, as educational consultant to Grace Bulman, Director of Dietetics Service at Central Office, and the additional appointments of chiefs and assistant chiefs of the Dietetic Division in the following areas: Branch Office No. 1, Boston Mass. Grace M. Covey, Chief; Branch Office No. 2, New York N. Y. Mary Rose Conway Assistant Chief; Branch Office No. 3, Philadelphia, Mrs. Alice Griffith, Chief, Florence O'Brien, Assistant; Branch Office No. 4, Richmond, Va., Violet K. Wallfred, Assistant Chief; Branch Office No. 6, Columbus, Ohio, Verdi Miller, Chief; Branch Office No. 10, Dallas, Texas, Edna Ward, Chief and Branch Office No. 12, San Francisco, Mrs. Helen Cahill, Chief and Margaret Rosenmeir, Assistant. In making the announcements Dr. Hawley stated that with the staffing of the Dietetic Divisions in the 13 Veteran's Administration Branch Offices throughout the country, recruiting for qualified dietitians will be intensified.

"Our need is growing. We can use approximately 150 dietitians at once and 150 more in the very near future," Dr. Hawley said. Applications should be made to the nearest VA Branch Office.

Insect Control. The Coordination Center of the Insect Control Committee, National Research Council, has prepared a convenient bulletin to provide abstracts of "open" reports on insect and rodent control. The reports were received from government agencies, the armed forces, universities and other sources. Inquiries may be addressed to the Coordination Center, National Research Council, Insect Control Committee, 2101 Constitution Ave., Washington 25, D. C. The contents of the first issue are grouped under biology, chemistry, dispersal, entomology, rodent control and general. (From JAMA, Vol. 130, March 16, 1946, p. 708)

Pioneer Health Telecasts. The Bureau of Health Education of the American Medical Association is producing a series of experimental telecasts over television station W9XBK, Chicago. Television should be a particularly useful medium for the demonstration type of educational program. What is probably the first medical telecast, was made by the Director of the Bureau of Health Education as a guest on the program entitled "Tea Time." The program was opened by the two participants sitting at tea in a living room and beginning a conversation about nutritionally adequate lunches. They then adjourned to a kitchen setup, where with actual foods and models they set up on a table three nutritionally adequate lunches consisting of different kinds of sandwiches, fruit, milk, skim milk or cocoa and ice cream for dessert. The arrangement of these lunches in attractive patterns on a table was accompanied by an informal conversation in which the nutritional values of each item were illustrated. (JAMA, Vol. 130, March 23, 1946, p. 791)

Course in Restaurant Administration. Another short course in conjunction with the restaurant administration program is being held June 17, 18 and 19 at the International House, University of Chicago. The subject chosen is "Modernizing the Restaurant," and will include discussion of fronts, layouts, equipment and placing, materials, and decoration. Those who are authorities in these specific fields are being chosen to participate.

Tri-State Hospital Assembly. At the Tri-State meeting May 1-3, held at the Palmer House in Chicago, the Illinois, Indiana, Michigan and Wisconsin Dietetic Associations sponsored a Conference of Dietitians. At the first session Breta L. Griem, president of the Wisconsin Dietetic Association presided. Dr. Margaret A. Ohlson of Michigan State College reported the results of a study of nutritional deficiencies of women and Dr. Ancel Keys of the University of Minnesota showed graphs, charts, photographs and informally described the recent research on the effects of human starvation on volunteer conscientious objectors.

The second conference of dietitians was presided over by Ruth I. Madsen, president of the Indiana Dietetic Association. At this meeting Margaret Bicknell spoke on the

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newer developments in frozen foods, and with particular emphasis on the new stratosphere freezing. Mr. W. M. Woll of the Commonwealth Edison Co., described the new developments in electronic cooking with the use of infra-red and high frequency heat. Gladys E. Hall, Executive secretary of the A.D.A. gave an interesting report on "What Is the Dietitian's Outlook for the Future."

Films. State and local dietetic associations may wish to obtain the new motion picture films which have been prepared for release by the USDA in connection with the Famine Emergency Program. The film "Suffer Little Children" is an account of what war did to the children of Europe and what is being done to help them. The film specifications are: running time, 10 min.; size, 16 mm., sound; type, black and white; no 35 mm. prints are available. The film may be obtained from the state agricultural service, or the state university film library, or your local film distributor. If you don't have a 16 mm. sound projector, cooperation may be obtained from the county extension agent, or local school officials, or a local commercial or industrial organization.

Alabama Dietetic Association. Marie L. Hines, secretary of the A.D.A., and Director of Dietetics at the University Hospital, Cleveland, Ohio, represented the national association at the spring meeting of the Alabama Association in Birmingham, April 13, and spoke at one of the sessions on the various association activities. Other speakers were Mrs. Ray Meade, State Commander, American Cancer Society, who spoke on "Cancer Control," and Dr. Edward A. Harris, Chief Pediatrician, T. C. I. Hospital of Fairfield, who spoke on "Treatment of Nephritis and Nephrosis in Children." Election of officers resulted as follows: Anne Gretschmann, president; Esther Scott, vice-president; Elizabeth Jacobs, secretary; and Mrs. Ine B. Crane, treasurer.

Arizona Dietetic Association. Governor Sidney P. Osborn extended a welcome to dietitians and home economists at a joint meeting of the Arizona Dietetic Association and the Arizona Home Economics Association in Phoenix, March 22 and 23. Mrs. Bessie Brooks West, national president, was guest speaker at the luncheon meeting of the A.D.A. and reported on activities of the national association. State committee chairmen made reports and plans for the coming year were discussed. Later, Mrs. West met informally with some of her former students who are now residing in Arizona. Dr. Ethel M. Thompson, professor of nutrition at the University of Arizona, and chairman, committee on research, reported on research being conducted in Arizona educational institutions and reviewed some recently completed problems in nutrition and related fields.

The Tucson Dietetic Association met on April 3rd. Mary Standefer, dietitian, Veteran's Hospital, was elected chairman for the coming year. Dr. Charles A. Janda of the surgical staff of Veteran's Hospital spoke on "Diet and Internal Medicine." A recent check of the 35 members of the Arizona Dietetic Association indicated that 16 are hospital dietitians, 5 are in college dining halls or commercial restaurants, 3 in public welfare work, 3 in the teaching profession, 1 in business and 6 are unemployed.

California Dietetic Association. The state organization held its annual convention May 13–14. Pertinent subjects in the field of dietetics were discussed. Dr. Helen Gillum of the University of California spoke on "The Dietitian's Post-Graduate Education and Opportunities;" "Major Contributions of Dietetics to the Management of Various Gastro-Intestinal Problems" was the subject of Dr. Otto Arndal's speech, and Richard Werner, California Department of Agriculture, talked on "Nutrition Conditions in Europe." Mrs. Doris Bernhagen, director of training for the Los Angeles Charities discussed the "Consideration of Patient Participation in the Teaching of Diets." Marguerite Richards, dietitian at the Fairmont Hospital in San Leandro reported on "Standardization of Procedures in the Dietary Department," and "Sanitation in Food Service Units" was the topic of a talk by Mrs. Anna Mary Lloyd of Scripps Memorial Hospital, La Jolla.

Essie L. Elliott, director of home economics for the California Fruit Growers, member of the A.D.A. and president-elect of the Home Economics Women in Business, has been appointed to the National Famine Emergency Council by President Truman. She is one of 125 members whose duties it will be to work with the committee headed by Herbert Hoover and Chester C. Davis. The work will consist of making suggestions and recommendations as the program develops.

Colorado Dietetic Association. The seventeenth annual meeting of the Colorado Dietetic Association was held April 3, at the Brown Palace Hotel in Denver. Mrs. Bessie Brooks West gave an inspirational address on "Your National Association, the Past, Present, and Future." Dr. Essie White Cohn, Professor of Chemistry, Denver University, talked on "Foods and Moods." The meeting received fine publicity and cooperation both from the press and the radio, and the attendance outnumbered that of any previous year. Officers elected were: Mary Ellen Johnson, St. Luke's Hospital, president, succeeding Lt. Ruth E. Lewin; Elizabeth Wolfe of the Colorado General Hospital treasurer; Mary Ruth Bedford of the Presbyterian Hospital staff was reelected secretary.

Florida Dietetic Association. The Ponce de Leon Hotel at St. Augustine was the headquarters for the annual convention of the Florida Dietetic Association. The two-day meeting was highlighted by many interesting speeches. Marie Hines, secretary of the A.D.A., spoke on "Relation of the Dietitian to the Nursing Education Program." "Nutrition in Rural Communities in Florida" was discussed by Pearl Laffitte, home demonstration agent for Duval County, and Mrs. Thelma Flannigan, Florida Department of Education, spoke on the "Florida School Lunch Program." Dr. Walter Wilkins, director of nutrition Investigations and Services, Florida State Board of Health, discussed the state-wide nutrition program. After a tour of the hotel kitchens and a luncheon the meeting was concluded with a speech by Marie Hines on "Our National Dietetic Association," in which the national activities and program were outlined.

Iowa Dietetic Association. The State organization held its annual spring meeting April 16 and 17 in Des Moines. Officers elected for the coming year were: Edna Kenney, of University Hospitals, Iowa City, president; Beatrice Donaldson, of Iowa State College, president-elect; Helen M. Hunt, Veterans Administration, Des Moines, vice-president; Minna Wyckoff, Coe College, Cedar Rapids, treasurer; Agnes Teigen, community service nutritionist, Cedar Rapids, secretary.

Idaho Dietetic Association. At the spring meeting of the Idaho Association, April 9–10, Mrs. Bessie Brooks West, president, A.D.A., was guest of honor and speaker. The conference opened with a dinner at which Mrs. West spoke on the national accomplishments in dietetics. Mrs. West also described the gradual growth of the A.D.A. from 58 members to the present complement of over 7,500 members. Special guests at the dinner were Dean Velma Philips, head of the home economics department, Washington State College; Selma Streit, head of institutional management of

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the same college; and Elizabeth Beveridge, home equipment editor of Woman's Home Companion. Margaret Ritchie, head of the University of Idaho home economics department, and president of the Idaho Dietetic Association was mistress of ceremonies. The second day's meeting was devoted to business and a workshop at the university, with Mrs. West as consultant. Leading the discussion of Idaho Association projects were Jane Gorsuch DeBuse, State Department of Public Health, Boise, and Sarah Nettleton of St. Luke's Hospital, Boise. Members of the I.D.A. were honored at a luncheon in the home economics department before touring various dormitory kitchens, and a nutrition laboratory at the university.

In addition to Margaret Ritchie, president of the I.D.A., other officers are Lorene Bales, Veterans Hospital, Boise, vice-president; Bernice Morin, University of Idaho, secretary; and Mrs. Helen Jensen Dick, St. Maries, treasurer.

Maryland Dietetic Association. Helen E. Walsh was guest speaker at the Maryland Association's dinner meeting May 6. Helen Baughman plans to do administrative work at Johns Hopkins Hospital this summer. She has completed one semester's work toward her master's degree at Columbia University. Virginia Heggie, formerly staff member at Mercy Hospital, Chicago, now is assistant dietitian at the Food Clinic of Johns Hopkins Hospital. Sally Brightman, recently discharged from the Army, and holder of the Bronze Star, also is on the staff. Mr. and Mrs. Wallace Wendt, the former Mary Eaton, have announced the birth of a son, Rodney Charles, on April 13, at Council Bluffs, Iowa. Mrs. Jennie Abramovitz has resigned as therapeutic dietitian at Sinai Hospital, Baltimore. Mildred Jones has been appointed to the position. Marcella Klimesh, recently discharged from the Army, is assistant dietitian at Sheppard Pratt Hospital, Towson, Md. Mrs. Louise Kay, formerly of Stanford University Hospitals, San Francisco, is the new assistant dietitian at Franklin Square Hospital, Baltimore.

Michigan Dietetic Association. Miss Mable MacLachlan, president-elect of the A.D.A., returned recently from her visit to several New England Dietetic associations. On March 8, she was the guest of the New Hampshire Dietetic Association at Concord. The luncheon meeting was held at the Eagle Hotel and following the business meeting Miss MacLachlan spoke on the work of the Association and the future program. Following this meeting the president-elect journeyed to the University of New Hampshire at Durham where she addressed the senior girls of the home economics department. In her talk she described the requirements for entrance to an approved training course and the work of a student dietitian in the hospital. On March 12, Miss MacLachlan attended the New England Hospital Assembly in Boston. She was a speaker at the dietetic session and her subject dealt with the contribution of the dietitian to hospital administration. In Hartford, Conn., Miss MacLachlan was the honor guest at a tea given by the Aetna Life Insurance Co., and spoke on the activities of the A.D.A. That same evening she was the guest of the Connecticut Dietetic Association at their dinner meeting in New Haven. Her subject was the work and plans of the A.D.A. The New England trip concluded with a meeting in Providence, R. I., with the Providence dietitians. This meeting was a combined affair for the Rhode Island Dietetic, Nutrition, and Home Economics Associations. Miss MacLachlan's topic was the various phases of dietetic work and the need of dietitians as leaders. News about Michigan members: Winning Pendergast is representing the Detroit Board of Education on the President's Emergency Faminine Committee. Ruth Duncan has recently opened the new laboratory at the American Red Cross headquarters in Detroit. This unit is equipped to teach and demonstrate food service and products, and is set up for class participation. Ann Mary Bennett has been appointed cafe manager of the Woman's City Club of Detroit and Jane Porter is assuming the duties of club manager for the organization. Mary Ellen Dambold, administrative dietitian, University Hospital, Ann Arbor, attended the National Restaurant Association meeting in Chicago. At the Ann Arbor annual meeting Jennie Day, University Hospital, was elected president; Dorothy Leslie, Stockwell Dormitory, first vice-president; Irene White, Ypsilanti Hospital, second vice-president; and Mary Ellen Dambold, University Hospital, secretary-treasurer. Miriam Diggs and Jean Petchell are new members of the University of Michigan Hospital staff. Dr. Margaret Ohlson and Dr. Dena Cederquist of the Department of Nutrition at Michigan State College, attended the meetings of the Federated Societies in Atlantic City, N. J. The inaugural of Dr. William Whitcomb Whitehouse as president of Albion College, Albion, Mich., was held on April 26. At the ceremony Dr. Mary I. Barber, Director of Home Economics for the Kellogg Co., represented Drexel Institute of Technology and Barbara Lee Butler of Dr. Barber's staff, represented Rhode Island State College.

Mississippi Dietetic Association. Mary Stansel Harvey directed the program for the April meeting of the Mississippi Association, held at Jackson. National policies, membership and questions regarding organization were discussed. Ethel Summerour of the Mississippi State College was elected chairman, and plans were made for an organization meeting in November. A nominating committee was appointed.

Montana Dietetic Association. Mrs. Bessie Brooks West, president, American Dietetic Association, was the guest at the annual Montana Dietetic Association meeting April 12, at Missoula, Mont. At the dinner meeting of dietitians, home economists and homemakers Mrs. West spoke on the "Importance of Dietetics as a Profession." In her talk she stressed the importance of good food for every child, and the necessity of teaching children good nutrition. It was her belief that the school lunch could be made to accomplish these two aims. Mrs. West also conducted an informal discussion group in which questions concerning local and national association problems were answered. Officers elected for the coming year were Sister Blesilla Cote, Columbus Hospital, Great Falls, president; Gertrude Walker, Northern Montana College, Havre, vice-president; Doris R. Janssen, Montana Deaconess Hospital, Great Falls, secretary-treasurer.

Minnesota Dietetic Association. At the April meeting of the Rochester Dietetic Association, Dr. P. W. Brown of the Mayo Clinic was the guest speaker. Dr. Brown, recently discharged from the army, spoke on his medical unit experiences in the South Pacific. He spoke also on the myriad problems connected with food service in the Pacific Theatre. Grace Erickson has been discharged from the Army after spending her army career in the South Pacific. She has joined the dietary staff of St. Mary's Hospital in Rochester.

At the Twin Cities Dietetic Association April meeting, Esther Latske of Armour and Co. was the featured speaker, and discussed "What is New in Meat." Betty Coe has resigned her position as dietitian at the University Hospital to be married. Mary Lou Dunkerley replaces Miss Coe as treasurer of the Twin Cities Association.

Nebraska Dietetic Association. The Omaha Dietetic Association elected the following officers: V. Jeanette

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Hamlin of Immanuel Hospital, president; Ruth Branstad, Methodist Hospital; vice-president; Betty Edmonson of the Dairy Council, secretary; and Marion Keller of Mutual Benefit; treasurer.

Inez White, Rose Knickrehm and Teresa Libershal attended the National Restaurant Convention in Chicago. Helen Claybaugh Mutz is teaching the Beginning Foods Course at the University of Nebraska. Helen Mitchell has been appointed therapeutic dietitian at St. Elizabeth Hospital in Lincoln and V. Jeannette Hamlin was recently appointed head dietitian at the Immanuel Hospital in Omaha.

New Mexico Dietetic Association. This state organization celebrated its second birthday in May. The history of the association is a testimonial to the faith and perseverance of Sister Bernard Marie, dietitian of St. Joseph's Hospital and Christine Heller, State Nutritionist. Their efforts to form a state organization began in 1936 at the time when the A.D.A. invited all the states to form organizations, and finally, in May 1944 the first official formation meeting was held. The scarcity of prospective members and the war emergency had hampered their efforts. At the first meeting at St. Joseph's Hospital in Albuquerque, Sister Bernard Marie was appointed chairman of the organization committee and Miss Heller served as her assistant. Louise Shelton of the Veterans Administration was appointed secretary. At this first meeting 15 members were present. In February, 1945 a second meeting was held and the first state officers were elected. Mrs. Elizabeth Simpson, head of the home economics department of the University of New Mexico was elected president; Margaret Moore, Veterans Administration, vice-president; and Lt. Mary Bowen, secretary-treasurer. In March, 1946 the New Mexico Association was host to Mrs. Bessie Brooks West, national president. Mrs. West visited the University of New Mexico and addressed students of dietetics. The annual meeting was held at St. Joseph's Hospital where after the business was concluded the meeting was turned over to Mrs. West. She spoke on the state association's relationship to the national organization and the future possibility of the dietitian, and also clarified several questions and problems confronting the New Mexico organization. Her last day in New Mexico was spent in historical Santa Fe, where she visited Bruns General Hospital and St. Vincent's Hospital.

New Jersey Dietetic Association. A joint meeting of the New Jersey Dietetic Association and the New Jersey Hospital Association was held in Atlantic City May 3–4. Included in the program were addresses by Alta B. Atkinson, professor of home economics at Columbia University on "New Horizons for the Hospital Dietitian," and by Lt. Nevella S. Harris, England General Hospital, on "Paraplegic Nutritional Problems." Sophia Morris of Beth Israel Hospital, Newark, led a round table discussion on current hospital problems.

The spring meeting of the New Jersey Association, held at Orange Memorial Hospital, stressed community education. "Dietetics in the Field Overseas," was the subject of a talk by Robert Schnitzer, of Orange Memorial Hospital. Loretta Brady offered suggestions for arousing adult interest in nutrition; Margaret E. Brennan, director of Newark school cafeterias, spoke on "The Part of the School Lunch in the Community Nutrition Program," and Elizabeth McHugh, Red Cross nutritionist, discussed aspects of community nutrition. "Post-War Kitchen Planning" was the topic of a talk by Owen T. Webber. Hulda Luthman has been appointed director of dietetics at Orange Memorial Hospital. Juanita Tripp was married to Ernest Palmer Evans February 5, at the Little-Church-Around-the-Corner, and the couple are living at Westmont, Que. Mrs. Evans was director of dietetics at Orange Memorial Hospital for many years. Mary Durney, graduate of the University of Delaware and recently on the dietary staff of Women's Medical College Hospital, Philadelphia, has joined the staff of Cooper Hospital, Camden. A son was born to Lee Conway Given on February 5. Mr. and Mrs. Given now live in Boise, Idaho.

New York State Dietetic Association. "Nutrition in the World Today," was the theme of the fifteenth annual convention of the New York State Dietetic Association which convened May 13–14, at Syracuse, N. Y. Morning session speakers were: Professor Ralph R. Scobey, of Syracuse University on "Signs of Protein Deficiency as Observed in Private Practice"; Professor Edward C. Hughes, School of Medicine, Syracuse University on "Nutrition in Pregnancy;" and Dr. Paul F. Hahn, Vanderbilt School of Medicine, on "Radio Active Iron as Used in the Study of Iron Metabolism." The afternoon session was devoted to community education and speakers and their topics were: Dr. John B. Youmans, Vanderbilt University, on "Recent Observations on the Nutritional Status of Europe," Jane Dale, Ph.D., of the State Health Department, on "Nutrition in the Public Health Program;" and Robert S. Harris, Ph.D., Professor of Nutritional Biochemistry, M.I.T., on "Food Habits of our Latin American Neighbors." The final day's program dealt with administration and professional education. Jean I. Simpson, Ph.D., Director, Frozen Foods Institute, spoke on "Expanding Field in Frozen Foods for Institutions," Frederick W. Smith, of Carrier Corporation gave a talk on "Freezing Equipment for Institutional Use" and Edwin Henricks of the Onodaga Pottery Company discussed "Proper Care of Glazes." Other talks were made by Kurt Lewin, Ph.D., M.I.T. Research Center, whose topic was "Influencing Peoples' Eating Habits;" Annie Louise Macleod, Dean, College of Home Economics, Syracuse University, who discussed "Keeping Up on the Job;" and Henderika J. Rynbergen of Cornell University who concluded the meeting with a "Report on the Study of Methods of Evaluating Effective Teaching."

Ohio Dietetic Association. The twenty-fifth anniversary of the Ohio Dietetic Association was celebrated on April 26 and 27 at the Commodore Perry Hotel in Toledo. "Maintaining Food Standards" was the topic of an address by Jane Porter, Food Manager of the Woman's City Club, Detroit, at the opening session. A workshop on test question construction was conducted by Aileen Merwin, Western Reserve University Hospital, Cleveland. Dr. Thomas E. Sharkey, Miami Valley Hospital, Dayton, spoke on "Diabetes" and Dr. Helen A. Hunscher, Western Reserve University, Cleveland, gave an address on "Know Your National Association." In a contest 7 student delegates, each representing training courses in the state, reported. The results were judged by an impartial board and the winner awarded her first year's dues for the A.D.A. membership. The meeting ended with a tea at the Toledo Hospital Nurses' Home, the Toledo Dietetic Association serving as hostesses.

Sister Josanne formerly dietitian at St. Elizabeth's Hospital has been appointed Head of the Home Economics Dept. of the New Lourdes Academy in Cleveland. Frances Tamarkin of North Side Unit will be married June 16 to Nathan H. Monus of Youngstown, Ohio. Miss Margene Anderson, former metabolic assistant in the Research Surgery Department at Ohio State University, was married in March to Rev. Cecil Wagstaff, in Chicago. Mary Jane Garvin has joined the staff of the Jewish Hospital in Cincinnati.

Akron Dietetic Association celebrated its first birthday April 18. Akron hospitals were well represented at the

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Ohio State Dietetic convention. Marcia Weston, Peoples Hospital; Ellen Martin, Childrens' Hospitals and Dorothy Ostryck, Doris Williams, Josephine Weagley and Frances Tolson were representatives. Margaret Newcomb has been discharged from the Army and soon will return to Elyria Memorial, Elyria, Ohio. St. Luke's Hospital, Cleveland, is trying an interesting patient education project; their patients are given menus from which to make their own selections. This is followed up by a colored card, placed on their tray, giving interesting comments on the histories of the foods they have selected, questions and answers about food, and facts about the hospital dietary.

Oregon Dietetic Association. At a recent meeting of the Oregon Dietetic Association in Portland, Dr. Ira Manville of the Nutritional Research Laboratory, University of Oregon Medical School, was guest speaker. He reviewed the recent discoveries in food values and their influence on the nutritional status of the public. At the election of officers, Margaret Fuller of Providence Hospital, Portland, was named president and Betty Jones, St. Vincent's Hospital Portland, vice-president. Marie Knickrehm, after 3 years Army service with South Pacific hospital units has joined the staff of the Good Samaritan Hospital where she will be engaged in metabolic work. Hazel M. Baker, dietitian at the University State Tuberculosis Hospital, resigned to be married. Helen Price, formerly of the Emmanuel Hospital, will replace Miss Baker. Jean Cameron, formerly a dietitian with the Federal nursery school program, is now doing therapeutic work at Providence Hospital in Portland. Etta Featherson resigned her teaching position at Emanuel Hospital because of ill health.

Pennsylvania Dietetic Association. The annual state association meeting was held May 1, 2 and 3rd, at Harrisburg, Pa. An interesting and educational program was presented. A quartette of speakers, Helen E. Gilson, Rena Eckman, Mary Huhn and Helen Dineed, discussed the trend of "Diet Therapy Through the Years." Lucille Refshauge, educational director of the A.D.A., spoke on "Briefing American Dietetic Association Plans," and Grace Nadig gave the Report of the Professional Education Committee. A panel discussion, "How to Teach Nurses," was conducted by Elizabeth Miller.

A highlight of the annual banquet was the introduction of dietitians returned from the service who described their Army experiences. The second day of the meeting, Alice M. Zabriskie, Industrial Feeding Specialist of the USDA, spoke on "Nutrition Education in Industry." Agnes Brumbaugh Moot's speech concerned "The Pennsylvania Nutrition Council." Trips offered the visitors included a tour of the state capitol buildings, visits to Harrisburg hospitals and cafeterias and excursions to the Hershey chocolate factory.

Tennessee Dietetic Association. The nominating committee announced the election of new officers for the Tennessee Association. Mary P. Wilson was named president-elect; Ruth Carpenter, vice-president, Helen Trapp, secretary-treasurer and Barbara Pisek, treasurer.

Utah Dietetic Association. The eleventh annual convention of the Utah Dietetic Association was held April 5 and 6, in Salt Lake City. The A.D.A. national president, Mrs. Bessie Brooks West, was the honored guest of the convention and sharing honors with her were Dr. Maxwell M. Wintrobe and Dr. Leo T. Samuels of the University of Utah, who spoke on "Folic Acid", and on "Body Adaptations to Changes," respectively. Mrs. West spoke on the need for more recruiting work among younger girls to interest them in the field of dietetics. The new school lunch plan was outlined by Rodney A. Ashby, of the Utah Department of Public Instruction, and Dr. W. A. Hoskisson of the state board of health discussed the need for new legislation in the school lunch program. The meeting concluded with the election of these officers: Sybil Christensen, Latter Day Saints Hospital dietitian, president; Jean Smith Sanders, Dee Hospital, Ogden, vice-president; Virginia Hagenson, L.D.S. hospital, secretary; and Ruth Kearns, Salt Lake City, treasurer.

Virginia Dietetic Association. The Baruch auditorium, Medical College of Virginia, Richmond, was the headquarters for the Virginia Dietetic Association meeting on May 10. The State Nutrition Committee arranged a program of speakers that included Dr. H. N. Young, director of the Virginia Agricultural Experiment Station at Blackburg, Va. Dr. Young reviewed the nutrition research plan for the station and reported on the progress of the Konnarock experiment. Miss Ada M. Moses, of the Experiment Station of the Clemson Agricultural College, Rock Hills, S.C., talked on the "Results of Nutrition Studies in Relation to School Lunches in South Carolina Rural Communities." Mrs. Ursula H. Duffus of the Department of State spoke on "The Role of the Food and Agricultural Organization of the United Nations in the Present Food Crisis."

Irene Renz, treasurer of the Virginia association was recently married to Robert E. Ritch and is making her home in Washington, D. C. Julia Pack Van Horn of the University Hospital at Charlottesville took over Mrs. Ritch's position as treasurer of the organization. Margaret Fitzhugh, school cafeteria director, Richmond, has been appointed delegate to the A.D.A. House of Delegates. She replaces Mrs. Elizabeth Burruss Woodard, who recently resigned. Mrs. Woodard formerly edited the state association's bulletin, *Lines*, and Elizabeth Lounds, Medical College of Virginia Hospital is the new editor.

West Virginia Dietetic Association. The annual meeting of the West Virginia Dietetic Association was held in Wheeling, May 25. Following the business meeting a program was presented that included a speech on "The Use of the Bland Diet" by Ona Stinson; "The Need for Coordinating the Work of a Dietitian with the Public Health Nurse," by Mrs. Walraven, State Department of Public Assistance, Charleston; and "Survey of the Choice of Fields in Home Economics as a Profession," presented by Ruth Noer of the Department of Home Economics, West Virginia University. Dorothy Franz gave a demonstration of a simplified method of making formula as used at Presbyterian Medical Center. The state association is headed by Margaret Joseph, St. Joseph's Hospital, Parkersburg; Dorothy Franz, Monongalia Hospital, Morgantown, vice-president; Marguerite Watkins, Williamson Memorial Hospital, secretary; and Ona Stinson of McMillan Hospital, Charleston, treasurer.

Wisconsin Dietetic Association. Christine R. Pensinger, Food Consultant, Marshall Field & Co., recently addressed the members of the Wisconsin Dietetic Association. In her talk on "Food Trends", Miss Pensinger summed up her findings of an extensive country-wide tour.

Butter production is about one-half of the 1941 output, and the major portion is being sold in the black market Mrs. Pensinger said. Sugar increase for manufacturers is being held up by the government in an effort to give the home canner adequate supplies. Soybean oil is being swapped by the United States to Greece for an equal amount of olive oil. Prices will be fixed at levels permitting the United States importers to market the oil at O.P.A. prices. Canned meat combinations, that were popular with the troops overseas, are being produced by American meat packers. Canned pork and apple sauce, canned scrambled

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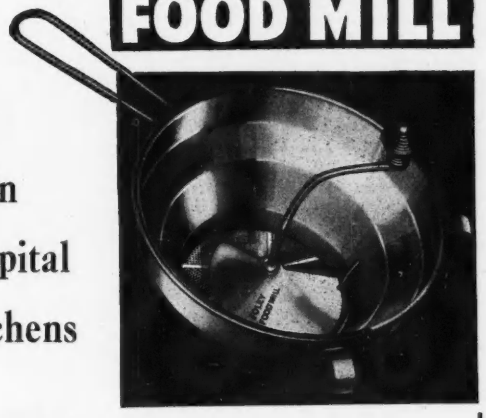

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eggs and ham are among a few of the proposed items. Dehydrated foods should be of especial interest to food managers on limited budgets. There are many dehydrated items available that with proper seasoning and cooking can be economical, delicious and nutritious. Miss Pensinger stated that prepared mixes are coming into their own in the hospital and institution field. They save waste, money and time, and assure a certain uniformity of product. Green and leafy vegetables prewashed and ready to cook may soon be adopted by hospitals and institutions. Peanut butter in bricks, developed by the Georgia State College, has proved an interesting experiment. It is less sticky, than that normally packed in jars and keeps well if refrigerated. New flavors have been added to the spread with orange, chocolate, malt and vanilla.

News about members. The following members of the American Dietetic Association have recently changed positions, or after service in the armed forces, have returned to civilian life and taken new assignments: **Jeanne C. Babler,** formerly associated with St. Mary's Hospital in Rochester, Minn., has been appointed ward dietitian at the Oak Forest Infirmary, Chicago. . . .**S. Faye Fowler,** co-author of the textbook, "Food For Fifty," has recently accepted the position of head dietitian at the Marine Hospital in Chicago. . . **Jane Gledhill,** moved from the Thomas D. Dee Hospital, Ogden, Utah, to her appointment as head dietitian at St. Mary's Hospital, Astoria, Ore. . . . **Bernice Haun,** former cafeteria manager of the Service Club, Fort Breckenridge, Ky., has accepted a similar position at the Service Club of Fort Knox, Ky. . . . **Ethel F. Kendall,** formerly with St. Elizabeth's Hospital at Baker, Oregon, has been appointed head dietitian to St. Joseph's Hospital in Tacoma, Wash. . . . **Mary L. Madden,** formerly with the Aultman Hospital, Canton, Ohio, has been appointed therapeutic dietitian to the City Hospital of Akron, Ohio. . . . **Frances LaVonne Marsh,** having served two years with the U. S. Army in the European Theatre has accepted a position with R. R. Donnelly Printing Co., of Chicago. . . . **Jessie M. Moseley** has successfully completed her dietetics course at St. Mary's Hospital at Rochester, Minn., and received her first appointment as dietitian to the Cullman Hospital, Cullman, Ala. . . . **Marjorie R. Manning,** formerly with King County Hospital at Seattle, has been appointed assistant dietitian at Scott and White Hospital in Temple, Tex. . . . **Sarah Ann Grimes,** formerly associated with the University of Chicago as supervisor of residence halls, has been appointed cafeteria manager for Government Service, Inc. This service embraces all feeding units for government buildings, excepting the Pentagon Bldg., and is under the supervision of Maye Hoover. . . . **Marguerite R. Murray,** having returned from overseas service with the 27th General Hospital Unit in the South Pacific, has been appointed assistant dietitian to Mills Memorial Hospital at San Mateo, Calif. . . . **Charlotte Perkins,** formerly with the Englewood Hospital, Englewood, N. J., has been appointed therapeutic dietitian at Norfolk General Hospital, Norfolk, Va. . . . **Cynthia C. Pine** has received her discharge from the U. S. Army and has been named therapeutic dietitian at the Veterans Administration Hospital, Hines, Ill. . . . **Helen B. Tipton** has accepted an appointment as nutritionist at the St. Joseph Nutrition Service, St. Joseph, Mo. . . . Recently discharged from the Army, Miss Tipton served on the hospital ship "Marigold" for over a year. She has an enviable service record, being the holder of the Philippine Liberation Medal with 1 Bronze Star, the American Campaign Medal, A. F. Campaign Medal with 3 Bronze Stars and the Meritorious Unit Award. . . . **Rachel L. Twitchell,** formerly on the staff of the Beverly Hospital, Beverly, Mass., has been appointed to the staff of the Stanford University Hospital in San Francisco. . . . **Ruth L. Frey,** back from duty with the Army has accepted an appointment to McKinney Veterans Hospital, McKinney, Texas. . . . **Alice Hay,** recently associated with the New York Hospital, New York, has transferred to the Illinois Research and Educational Hospital, Chicago. . . . **Helen Priebe,** recently in service with the WAVE's has been appointed therapeutic dietitian at Harris Memorial Methodist Hospital at Fort Worth, Texas. . . . **Eleanor P. Faricy,** having received her Army discharge has accepted a position as dietitian at James Walker Memorial Hospital, Wilmington, N. C. . . . **Shirley Tacon,** recently associated with the Mercy Hospital in Chicago, has been appointed administrative dietitian at St. Joseph's Hospital in Chicago. . . . **Virginia Lee Ames,** recently discharged from the army has been appointed assistant dietitian to the Director of Residence Halls at the University of Missouri, Columbus, Mo. . . . **Betty Reiss,** recently separated from the Army, has joined the staff of the Columbia Hospital, Washington, D. C. as assistant dietitian. . . . **Elizabeth Fortune Daub,** formerly with the Veterans Administration, Marion, Ill., has accepted the position of dietitian at St. Mary's Hospital in Evansville, Ind. . . . **Lucia Fordyce** has resigned as dietitian at the University of Wyoming to join the Krebs Dairy Company at Cedar Rapids, Iowa. . . . **Dorothy B. Hacker,** formerly nutrition consultant to the Visiting Nurse Association in Detroit, has accepted a similar position with the New Mexico Department of Health, Santa Fe, New Mex. . . . **Clarice Mae Eppeland Friedman,** formerly a dietitian at the State University of Iowa Children's Hospital, has accepted an appointment as assistant dietitian at St. Luke's Hospital in New York City. . . . **Jean Dail Tillett,** formerly associated with Duke University as teacher and therapeutic dietitian, has been appointed dietitian at Presbyterian Hospital, Chicago. . . . **Meredith Jones** has transferred from the dietary staff of the Memorial Hospital, Syracuse, N. Y., to the New York Hospital in New York City, where she will act in the capacity of assistant director of diet therapy and education. . . . **Frieda Sherman,** recently separated from an Army Hospital in San Francisco, has accepted a civilian appointment at the Good Samaritan Hospital in Los Angeles, Calif. . . . **Elizabeth Hunter Fenrite** has resigned from the Lake Forest Hospital in Lake Forest, Ill., and has been appointed to Providence Hospital, Oakland, Calif. . . . **Helen L. Lynch** has returned to civilian life after serving as chief dietitian to the 51st General Hospital in the Southwest Pacific. She has accepted a position as Home Economist with a Los Angeles firm. . . . **Betty Branigan Gebbie,** recently separated from the U. S. Army with 2 years service to her credit has accepted an appointment as head dietitian at the Veterans Administration Hospital at Hines, Ill. . . . **Ethel Heaberlin,** recently associated with the Poultry and Egg National Board, has joined the staff of St. Joseph's Mercy Hospital at Ann Arbor, Mich., as head dietitian. . . . **Mattie May Reavis** has resigned from the staff of the North Carolina Baptist Hospital at Winston-Salem, N. C., to join the dietetic staff of Roper Hospital at Charleston, S. C. . . . **Murell Dilworth,** recently discharged from the Army, has joined the dietary staff of the Veterans Administration Hospital at West Los Angeles, Calif. . . . **Harriet R. Kossove,** former therapeutic dietitian with the 109th General Hospital in England has been separated from the Army and has joined the staff of the Marine Hospital at Norfolk, Va. . . . **Mary Lou Gilmore Klebanoff** has joined the staff of Wesley Memorial Hospital in Chicago. She was former head therapeutic dietitian at Jackson Memorial Hospital in Miami, Fla. . . . **Phyllis Loper Winston,** formerly associated with the Oklahoma University Hospital in Oklahoma City, has joined the dietary staff of the Good Samaritan Hospital, Cincinnati, Ohio. . . . **Soini L. Makivirta** has been appointed to the Veterans Administration Hospital, Hines, Illinois. . . .